

AIDS DURING LABOUR:

INCLUDING

THE ADMINISTRATION OF CHLOROFORM,

THE MANAGEMENT OF THE PLACENTA,

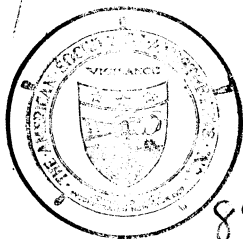
AND

POST-PARTUM HÆMORRHAGE.

BY

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PREFACE.

WITH so many standard works on the Principles and Practice of Midwifery, it may be thought that any additional writing is superfluous; particularly, too, when treating of ordinary labour. A too general opinion exists, sanctioned by high authorities, that not only is nature equal to her functions, but that any interference is needless and injudicious. Labour often commencing favourably, is terminated with difficulty; and if the mother do well, the child is then frequently still-born. The evil effects resulting from civilized life, marriage, too, depending upon the circumstances of individuals, and not natural inclination; and consequently, child-bearing in many cases commencing somewhat late in life, make requirements at the hands of the accoucheur. Not only is it his duty to do all that

art can accomplish to effect a safe delivery, but also to save suffering as much as possible. It is hoped that the following pages show all that can be done under such circumstances.

The Principles of Midwifery are not agreed upon; opposite opinions exist, and in cases requiring promptitude in action, conflicting views, and treatment uncertain in its results are advocated. The recent controversy in the *Lancet* on bandaging the abdomen after delivery clearly evinces this. The author has endeavoured to show the necessity for bandaging, and the cause of this necessity. It will be found very fully discussed, in the hope of effecting a better agreement on the subject. Even the mode of action of the uterus is a matter of dispute—some affirming that it commences at the cervix, and others at the fundus. The effects of retention of the liquor amnii, and of the premature discharge of it, are not agreed upon—some accoucheurs dwelling upon the evils resulting from its escape before the dilatation of the os uteri, others disregarding it, or effecting it when post-partum hæmorrhage is dreaded: nor

are the effects of prolonged retention of it on the stages of labour better understood. Undue retention has been considered, and different practice advocated to what is ordinarily adopted. The physiological effects of chloroform in labour, and its administration, have been treated on, to aid in removing prejudice, and bringing it more generally into use. The differences as regards the necessity for supporting the perinæum, and the methods of doing so have been referred to.

The management of the placenta, and the treatment of post-partum hæmorrhage have been especially considered. The author believes that the latter will be found more fully described than in any existing work. In both of them, different and conflicting opinions are examined, and means suggested of more easy and successful application. In all cases, for the sake of fairness, and to prevent any misconception, the very words of authorities are quoted, and duly acknowledged. Different treatment has not been advocated theoretically, but has been successfully used in practice.

Continued interruptions and want of time have prevented the author treating these subjects as he could have wished. The importance of them he hopes will be deemed a sufficient apology for intruding the following pages on the reader, and will lead to a considerate reception. If the views set forth be agreed to, and lead to the adoption of a practice that may prove serviceable to the accoucheur, and beneficial to the patient, his object will be fully attained.

31, BAYHAM TERRACE, CAMDEN TOWN,

November 15th, 1855.

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AIDS DURING LABOUR.

CHAPTER I.

INTRODUCTION.

DIFFERENCES of practice being taught, opinions too agreed upon, not always leading to corresponding treatment, and in some cases rules being somewhat vague and uncertain, the object of the following pages is to advocate a more uniform mode of management, to offer a few suggestions, and to develop existing views.

The accoucheur learns the mechanism of labour, the positions of the head, and the necessity for supporting the perinæum: aiding muscular action by supporting the uterus, and relieving unnecessary distension by evacuating the liquor amnii, when the pouch of membranes has fulfilled its purpose, are not sufficiently recognised in practice. The use of chloroform, and of the bandage after delivery, and the time and circumstances under which the latter should

be employed, are still matters of disagreement. The management of the placenta is not, at the commencement of practice, usually sufficiently understood; one of the greatest difficulties and dangers too often results from this,—viz., retention and hæmorrhage, the treatment of which is obscured by different circumstances attendant upon it only justifying certain treatment, the success of which cannot be fully relied on. The amount of hæmorrhage in labour is commonly greater than need be, and when it amounts to flooding, the ordinary means of arresting it are found inefficient, and death is too often the result. The *quantity* of blood lost, and the *ultimate* effect on the constitution of the patient, are too little regarded, the *immediate* result being chiefly considered. The *prevention* of hæmorrhage does not usually receive the attention it deserves, and the means employed are ordinarily inefficient for the purpose. “We are *never* perfectly secure against hæmorrhage coming on during the first few hours after delivery, even where everything has turned out as favourably as possible.”* Consequently, all women incur some risk after the accoucheur has left his patient. Fortunately, these cases are of rare occurrence—still they do happen, and

* Rigby, p. 218.

from their suddenness and danger are of serious import, particularly too when the attendant lives some miles off, as in the country. Not unfrequently a tolerably free discharge occurs two or three hours afterwards, which subsides without interference.

It might, and probably from the usual treatment has been thought, that art has little to do with ordinary labour, and that treatment presently to be advocated is unnecessary interference with nature's functions, and that whatever is calculated to hasten labour must be injurious. Doubtless "quick, rapid labours are by no means desirable, for they are seldom safe."* Still, it must be a matter of reproach if unnecessary suffering be allowed, particularly too if the aid rendered increases the safety of the patient, whose perils are so greatly augmented by the habits of civilized life. "In a state of natural simplicity, women, in all climates, bear their children easily, and recover speedily; but this is more especially the case in those countries where heat conspires to relax the fibres. The quality or quantity of the food has much less influence than the general habit of life upon the process of parturition. In a savage state, women, though living abstemiously, and often

* Rigby, p. 110.

compelled to work more than men, bear children with facility; whilst in this country women who live on plain diet are not easier than those who indulge in rich viands.”* Mr. Roberton, who has ably written on “The Study of Midwifery as a Science,” remarks—“A physiologist, once of considerable repute (Sir Anthony Carlisle), has ventured to assure us that childbirth, like parturition in the lower animals, is purely a natural process, the safety of which Divine Providence has most wisely secured; and consequently, that it is always mischievous to tamper with pregnant women, under the pretence of hastening, easing, or retarding their delivery. If this be correct, it follows of course that midwifery is no science, but a presumptuous fraud.”† “If we are to believe some who have lived among barbarians, and written of their habits, childbirth in them is *uniformly* easy and expeditious; nearly as much so as the performance of the simplest of the animal functions. A variety of recent valuable evidence on this point (furnished chiefly in casual hints and allusions, the most unexceptional kind of evidence) leads to a very different conclusion. So far is parturition from being *easy, expeditious, and safe* in every instance, we have reason for thinking that

* Burns, p. 350.

† Page 470.

difficult labours are as numerous with them as with us.”* Mr. Roberton also writes, that “in labours *strictly natural*, terminating after a few hours of moderate suffering, scientific midwifery is passive, its interference extending only to the division of the funis; but in lingering and in acutely painful parturition, many are the expedients of its devising, all devoid of danger, and all more or less effectual, provided their application is directed by those competent to do so.”† However, we cannot admit that scientific midwifery only permits of the division of the funis in purely natural labour, for science suggests supporting both the perinæum and uterus during the expulsion of the child—the former to avert laceration, the latter to facilitate the expulsion of the placenta; for we can never know that a labour will be “strictly natural” before or at the completion of the second stage of it. There can be little doubt but that labours are too frequently treated as too strictly natural, and that the accoucheur is content to be with the case just at the time of delivery. When complaining of severe suffering, and of its long continuance, the woman is often told that all is going on well, and that she must continue patient; when, perhaps, an obliquity

* Page 476.

† Page 489.

of the uterus exists from relaxation of the abdominal parietes, preventing the pains telling upon the os uteri, or aid could be given by compressing the abdomen during the pains, or the action of the uterus could be increased by discharging the liquor amnii when it ceases to be of any service, and is only retarding labour by diminishing the power of the uterus by unnecessary and prolonged distension. The advantages of chloroform have yet to be fully appreciated in preventing exhaustion from long-continued suffering, and relieving rigidity of the os uteri and perinæum.

Not only are women educated in a most unnatural way, and their proper development checked—which will be adverted to in the next chapter—but they also too often, from marrying unnaturally late in life, fall pregnant at an age when many women have almost or quite ceased child-bearing. In such cases, from the unyielding state of the parts, art may avail greatly, as well as in the majority of ordinary first cases. Were more attention paid to the woman during delivery, and were the recovery of it treated less strictly, as regards dieting and medicine, in many cases a greatly improved practice would result. Parturition is not sufficiently regarded as an act of nature, and not an illness;

women are frequently too much drugged, and infants too, and the exhaustive effects of severe labour, or of a considerable amount of hæmorrhage, are prolonged by too strict a regimen and too low a diet. "When a woman is recently delivered, the attending circumstances—as the discharge of the waters, the exclusion of the child and of the placenta, together with the lochial discharge—commonly reduce her to the state of a person who has had a profuse evacuation of any other kind. The great efforts she may probably have made, in the course of even a natural labour, must also for a time considerably increase this change in her constitution. From what causes does this change arise? From emptiness, and the fatigue consequent to vehemently increased action. Is it possible to fix upon any better method of treatment than what would be esteemed right and proper under the same circumstances from any other cause; that is, to give her suitable refreshment, and to leave her to repose? Judging from events we certainly cannot; and after seeing and considering much practice and trying various methods, not only immediately after delivery, but through the course of childbed, I (Dr. Denman) am fully persuaded that, laying aside all refined speculation, those patients will fare the best and recover most certainly

and speedily, by whom the least change from their former habits is made. Some difference of treatment must necessarily be required for the delicate and the robust, for the nervous and the plethoric, when there has been a long and difficult, or a short and easy labour, in a hot or cold climate, in summer or in winter, and in the same climate, under particular situations and circumstances. These must of course be left to the judgment of the medical attendant; but when no particular reason which demands a contrary treatment exists, I (Dr. Denman) am convinced that the general principle of making as little change as possible from their former habits and customs, either in diet, or in any other respect, will best answer his expectations.”* It is however far better to err by too great strictness, in refusing the patient to sit up too soon, for a too early getting up is probably the most fruitful source of prolapsus uteri that exists, and commonly causes a renewal of the discharge, which may amount to a considerable hæmorrhage. In no particular is there so marked a difference between women in a savage and civilized state, as the condition that exists after delivery: the former return immediately to their pursuits as usual, while the latter require to be kept quiet in the

* Denman, p. 449.

recumbent position for several days. This must be mainly owing to the greater amount of muscular strength existing in women in an uncivilized state. The uterus must contract with greater power, and consequently hæmorrhage is not likely to ensue.

CHAPTER II.

MUSCULAR ACTION, AND CIRCUMSTANCES
AFFECTING IT.

THE uterus is regarded as *the* expulsive organ ; but the aids to its contractions from the action of the abdominal muscles, whilst admitted, are not rendered available to their full extent in ordinary midwifery practice. "When the pelvis and thorax are fixed, the abdominal muscles can constrict the cavity and compress its viscera, particularly if the diaphragm be made to descend at the same time, as occurs in vomiting or in expulsion of the foetus." Again, "should the abdominal muscles and the diaphragm be both brought into action together, the viscera will be compressed between them, and forced towards the lower part of the cavity, as occurs in the expulsive efforts of accouchement."* Every accoucheur witnesses the great muscular efforts of the patient attending the "bearing pains" of severe labour, and often hears the plaintive

* Quain's Anatomy.

exclamations, that she will not have strength to bring forth. It is at such a time that great aid can be rendered; one pain may be made often to do the work of two pains, and occasionally instrumental aid may be prevented. I feel convinced that in difficult labour I have sometimes averted its being instrumental, by compressing the abdomen and uterus with the left hand forcibly during the continuance of the pains for a considerable length of time. The forceps merely accomplishes what muscular contraction is unable to effect. "One of the most dangerous errors relative to the forceps that a student could take up, would be the opinion that the forceps is a compressive instrument by its very design: it is not so—it is an extractor—it is a *tire-tête*; and I (Dr. Meigs) think it ought to be established as a principle in obstetrics, that where there is not space enough for the descent of the head without the forceps, there cannot be produced a due proportion by merely squeezing the head down to the required dimensions by such an instrument."* Unfortunately, the physical development of women is too commonly restrained, by the abominable fashion of wearing stiff stays—too often tightened to make what is supposed to be a good figure, when in reality it is the re-

* Meigs, p. 295.

verse ; and exercise capable of producing muscular development, is in every way restrained at school ; to be succeeded by sedentary habits, exciting reading, and often irregular hours at home ; and thus the girl is placed in as enervating and unnatural a state as can be contrived. The only wonder is that such women do not suffer more, and that cases of difficult and tedious labour are of not more frequent occurrence. It happens however, in many of these cases, that from general relaxation the parts yield more easily, as well as the head of the child ; but yet more hæmorrhage is likely to happen from this relaxed state of system existing. It is in primiparæ, under these circumstances, that the greatest difficulties have to be encountered, particularly when bad has been made worse by high living and insufficient exercise during pregnancy, causing occasionally increased development of the child, and consequently greater difficulty of expulsion. Still, the greater is the necessity for the accoucheur to be able to give such aid as may compensate for the deficiency of power in the woman. According to Dr. Churchill's statistics, out of " 23,755 cases of labour, we have 653 prolonged beyond twenty-four hours, or nearly one in thirty-six."*

* Churchill, p. 197.

These cases were taken *indiscriminately*, but were they selected from the class of females educated as described above, or could statistics of first cases under these circumstances be obtained, the number of difficult cases would be found much larger. Dr. Collins's report of 430 cases of protracted labour gives the following results :*—

TOTAL CASES, 430.	STILL-BORN CHILDREN, 150.	MOTHERS DEAD, 40.
Delivered by forceps . 12	Still-born . . 4	Mothers dead . 0
— perforating . 79	— . . 79	— . 15
— preternaturally 15	— . . 6	— . 0
— naturally . . 324	— . . 61	— . 25
430	150	40

Dr. Murphy remarks, “from this table you perceive that of 430 cases in which labour lasted twenty-four hours or exceeded it, 324 of them were natural cases, delivered without assistance; and that of these 324 the children were lost in sixty-one instances, which would be about one in five cases. The result of my own inquiries on this subject is nearly similar, and has been obtained from the same source—the Dublin Lying-in Hospital. In 5699 cases, 218 were protracted to this degree, and of these 175 were

delivered naturally, and forty-one children not putrid were still-born, being one in four, nearly.”* “Among these cases which I (Dr. Murphy) have observed, there were eight deaths (of the mother) in 175 cases, or one in twenty-two.”† According to Dr. Collins’s table, the cases proving fatal to the mother were about one in eleven. The number of protracted cases in Dr. Murphy’s practice is greater than in Dr. Churchill’s table, being about one in twenty-six, instead of one in thirty-six; the latter, however, is from a much larger number of cases—23,755, occurring in the practice of several accoucheurs. The loss of mother and child is large in protracted labour, the danger of which arises commonly from the prolongation of the second stage of it. To curtail this without injury to the mother or child, would be to add to their safety, to diminish suffering, and should be attempted by art.

The most ordinary cause of prolonged labour is *deficient muscular power* in the woman, and is observed most commonly in first cases, particularly, too, when marriage has been contracted late in life. When the labour is difficult, and the development of considerable muscular power is required, we find it fail. It will be found in delicate

* Murphy, p. 146.

† Ibid. p. 148.

weakly women, or those enfeebled by disease—particularly by phthisis and bronchitis, which prevent the fixing of the chest. The pains, at first strong and regular, become shorter and impulsive. The woman strains violently for a few seconds, but the steady continued bearing down is wanting. The moulding of the head is interfered with, and arrest of it occurs. The test of muscular strength is the length of time it can be exerted; and in those women in whom it fails, the nervous system is more excitable, and exhaustion is hastened by the greater amount of suffering, and instrumental aid becomes necessary. “It is meant when the forceps are used, to supply with them the *insufficiency* or want of labour-pains; but so long as the pains continue, we have reason to hope they will produce their effect, and shall be justified in waiting.”* It has been previously stated, that “in a state of natural simplicity, women in all climates bear their children easily,”† as a general rule. When in civilized life physical development is neglected and checked to the utmost, it cannot be wondered at that women should sometimes prove unequal to the task, or can only effect delivery with great difficulty. The prevention of this state of

* Denman's Aphorisms, p. 12.

† Burns, p. 350.

things is unfortunately beyond the accoucheur's control, still he may aid greatly, by pressing the uterus during the pains, and can, in a degree, supply a deficiency of muscular power that may exist.

Mr. Robertson's statement, "that we have reason for thinking that *difficult* labours are as numerous"* with women in a savage as in a civilized state, is easy of explanation, from the degraded position they occupy, the brutality they experience, and from the undue amount of muscular and osseous development from the laboriousness of their lives. The hard work they undergo would tend to make the pelvis approach that of the male in form, and if there be greater expulsive power, it is negatived by the greater resistance it encounters by the unyielding nature of the tissues. Hence either extreme is bad; but that resulting from the evils of civilized life is the worst, from the weakened state of constitution, and the danger of hæmorrhage resulting.

Dr. Barlow, in an able article on the Physical Education of Girls, writes—"Even under the more favourable circumstances of country life, they are too much restricted from the free exercise which health requires. Their very dress

* Page 476.

unfits them from taking it; and the alleged indecorum of those active movements to which youth and spirits instinctively incite, is a bar to even the attempt being made. At their age, the measured, slow-paced, daily walk, is quite insufficient even for the muscles specially engaged, while it leaves many others wholly unexercised. If this be true of the more hale and robust inhabitants of the country, how much more forcibly does it apply to the delicate and attenuated residents of towns, and especially to the inmates of female schools.”* And in a note to the above by Sir J. Forbes, he adduces the rules of a young ladies’ school, showing that only one hour in the day was allowed for exercise, and that, too, provided the weather was fine; he also states, that after a careful and accurate inspection of a boarding-school in a large town, containing forty pupils, there was *one* of the girls, who had been two years there, whose spine “was not more or less *crooked*,” and he further adds, on the “authority of personal observation, and on an extensive scale, that scarcely a single girl (more especially of the middle classes) that has been at a boarding-school for two or three years, returns home with unimpaired health;” and he

* Cycl. Pract. Med. vol. i. p. 697.

graphically describes their exercise as “that most melancholy of all processions—a boarding-school of young ladies in their walk.”

Occasionally from extreme debility and the exhaustive effects of disease, delivery is rapid. From great relaxation existing, the head passes without meeting much resistance. On the other hand, sometimes from violent and continued muscular action, the labour is dangerously quick. Dr. Rigby remarks, “in some cases the intervals between the pains are scarcely perceptible, for one pain has scarcely left off before the next has already commenced; or the uterus falls into a state of *continued violent contraction*, which does not cease until the child is driven into the world. *The abdomen is very hard during the pain*, the whole body stiff and rigid; the patient expresses her sufferings very loudly, or actually raves with pain. From the constant and irresistible effort to strain, it seems as if she has scarcely time to get her breath, for she continues to hold it so long that respiration might be almost supposed to have stopped altogether.”*

We may then deduce:—

1stly. That the contractions of the uterus are aided by “the consentaneous action of the

* Page 229.

assistant muscles,"* and that the contractions of the abdominal muscles and diaphragm constrict the cavity and aid the expulsive efforts of the uterus.

2ndly. That when the muscular system is well developed in natural labour, (as Burns states,) women "bear their children easily," especially "in those countries where heat conspires to relax the fibres."

3rdly. That muscular development is prevented by the unnatural restraints imposed upon girls during their education, and that consequently the second stage of labour sometimes cannot be completed without extraneous aid.

4thly. That labour may be what Dr. Rigby terms "precipitate when the patient is weakened by previous disease, and the soft parts are very relaxed and flaccid,"† a state very likely to be accompanied with flooding; or it may be so from too violent and continued muscular action, which may produce laceration, and also hæmorrhage, from the uterus continuing to act after the delivery.

5thly. It follows as a corollary, that giving support to the abdominal parietes during the "bearing pains" when labour is severe, is not

* Carpenter's Human Physiology, p. 637.

† Page 234.

“meddlesome midwifery,” but is only imitating nature, and supplying a deficiency produced by a faulty education.

Muscular power is sometimes diminished from relaxation of the abdominal parietes, accompanied with a tilting forwards of the uterus. The abdominal muscles become relaxed from the repeated distension of former pregnancies, and when proper bandaging after delivery has been neglected. Under these circumstances not only do the muscular parietes fail to constrict the cavity of the abdomen, but also to fix the uterus, which inclines forwards more or less according to the amount of relaxation. The more the uterus hangs forwards the more will the os tinæ be inclined backwards towards the sacrum. The action of the uterus is then misdirected, it tells upon the anterior lip of the os uteri, which becomes stretched out like parchment over the head of the child, and the first stage of labour may be unnecessarily prolonged. This displacement varies in degree, and occurs to a slight extent probably more frequently than is suspected. Unless it be corrected, much needless suffering occurs.

Prolonged distension of the uterus by undue retention of the liquor amnii weakens its action, and unnecessarily prolongs labour. The first

stage of labour is said to be completed when the membranes rupture, during which time the uterus only is in action ; but during the second stage with the “bearing pains,” both the abdominal muscles and diaphragm contract forcibly, constricting the cavity of the abdomen and compressing the uterus. The three stages of labour, however, are not always distinct, according to the division of natural labour in books ; the first two sometimes terminate simultaneously, and occasionally all three become blended into one. I attended a patient who, twice successively, was prematurely delivered at seven and six months respectively, and each time delivery occurred with the membranes unbroken, and they had to be ruptured to extricate the child. The former one was still-born ; the latter, a male child, only weighed 1 lb. 8½ oz. avoirdupois, and measured 14¾ inches long and 9¼ around the base of the cranium. He cried vigorously for his size, micturated freely, the bowels acted twice, he took small quantities of milk and water, and lived 23¼ hours. Sometimes at the full period the liquor amnii escapes, and the child and placenta are expelled almost at the same moment ; occasionally, too, even the liquor amnii is discharged directly after the expulsion of the child, and sometimes before

labour has commenced. I had a case where the waters were discharged three weeks prior to any labour pains or dilatation of the os uteri, and was succeeded by as rapid and easy a delivery as when this had not occurred.

The division, therefore, of the first and second stages in many cases does not hold good, the former extending sometimes into the latter; the detection of which is of importance in practice, as needless suffering may be prevented. The first stage should be limited to *the dilatation of the os uteri and the descent of the presentation*, and not to the discharge of the liquor amnii. Dr. Denman defines the first stage as “the complete dilatation of the os uteri, the rupture of the membranes, and the discharge of the waters,” including “all the circumstances which occur, and all the changes made from the commencement of the labour.”* Dr. Burns’s definition of the first stage is preferable: “The os uteri being considerably dilated, the second stage begins;† but although the first stage of labour is not always accompanied by the discharge of the liquor amnii, and very commonly is not so, still its retention then may be termed unnatural; for instead of being of any aid, it only retards labour, gives unnecessary suffering,

* Vol. i. 343.

† Page 246.

and if it escape just before or at the time of the birth of the child, may be a cause of flooding from the sudden emptying of the uterus, which will again be referred to. The use of the bag of membranes is to distend the os uteri, and the value of this fluid wedge is, that by its equable pressure, it does so without exciting irritation or inflammation; when this is accomplished, its utility ceases, and it may advantageously be discharged.

Most authors on midwifery dwell on the evils arising from the *premature* discharge of the liquor amnii, and describe such labours as being lingering; that there is danger of the head acting too powerfully on the os uteri, and of inflammation instead of dilatation occurring; besides its often being the forerunner of a preternatural presentation. In first pregnancies, particularly, too, if late in life, unquestionably the premature discharge of the waters interferes with the dilatation of the os tincæ; but in subsequent deliveries, the evils to be apprehended are rather exaggerated, and this has probably led accoucheurs to be too chary of rupturing the membranes when no further good could arise from the retention of the waters. I believe that in many cases a rigidity of the os uteri is the *cause* of the premature discharge

of the liquor amnii, and not the effect of it. Dewees remarks, "Every day's experience proves that the most perfect and most speedy relaxation of the mouth of the uterus takes place without any such influence."* I feel convinced that more evils and suffering arise upon the whole from undue retention than from premature discharge; in both cases, labour is usually prolonged—certainly in the former—when an unnecessary amount of severe suffering occurs, with a probability, if the retention continue until or near delivery, of hæmorrhage succeeding.

The undue retention of the liquor amnii prolongs the labour in two ways:—1stly, fluid pressure is equable in all directions to which it is applied, consequently it modifies the power of the uterus by re-acting on it, particularly, too, if the head be engaged with the pelvis; 2ndly, the greater the distension of the uterus, the less will be its muscular power; so also with the abdominal muscles, which may be additionally weakened by retention of urine, and constipation.

Occasionally the membranes rupture so partially, and high up, and the head descends so quickly, that the liquor amnii cannot escape until the birth of the child; every endeavour

* Page 181.

should be made to avoid such an occurrence, on account of the increased suffering and greater likelihood of hæmorrhage. In many of these cases, rupturing the membranes when they have accomplished their purpose, would avoid this : such a practice, too, is only imitating nature, and cannot be “meddlesome midwifery.” In such cases, Denman writes, “If there be no particular reason against our waiting, it is better not to interfere, but to leave the business entirely to nature, explaining the state of the case to the patient or her friends, taking care to prevent their apprehension of danger from the delay of the labour, and not by our solicitude to raise their expectations or their fears unnecessarily. But when the water dribbles away in the advanced state of a labour, or there is reason for our wishing a speedy conclusion of it, either on account of the mother or child, it will be expedient to forward the discharge of the water by raising the head of the child a little higher into the pelvis.”* Burns writes—“I cannot, however, go the length of some who say that the artificial evacuation of the water is always hurtful ; for there are circumstances in which it may be allowable, and is beneficial. It is allowable, when the os uteri is fully dilated and the

* Vol. ii. p. 16.

membranes protruded, perhaps out of the vagina.”* Done judiciously when the membranes have not yielded at the ordinary time—many pains will be saved the woman which are of no avail to her whatever: for instance, often without an excess of liquor amnii producing overdistension of the uterus, existing, the membranes are too thick or tough to allow of their yielding as usual, prolonged distension of the uterus occurs, and this, with the well-known hydrostatic law of fluid pressure being equable in all directions, influences the labour by diminishing the contractile power of the uterus, and by diffusing the force prevents its telling proportionately.

The liquor amnii, according to authors generally, retards labour by its premature escape, or from being in excessive quantity. Undue retention of it is not usually considered or treated of as a cause of protracted labour. Dr. Churchill gives “toughness of the membranes” as a cause of tedious labour, *i.e.*, from delay in the *first* stage of it. It has, however, been shown that it influences chiefly the *second* stage of labour. He remarks, “Generally speaking, the membranes yield to the pressure from above, about the time when the os uteri is fully dilated; but

* Page 365.

this is not always the case. They sometimes remain entire until protruded through the external orifice, but in *these cases without causing delay*; in other cases, their adhesion to the uterus is more firm, and they neither break nor protrude, but of course occasion a prolonged first stage, because the liquor amnii which is retained, *prevents the more forcible contractions* of the uterus. The *delay* should never, on slight grounds, be attributed to this cause, and *not unless the pains are active*, and the *os uteri perfectly dilatable*: when no doubt remains, the remedy is obvious—viz., to rupture the membranes.”* Dr. Rigby writes: “The membranes when too thick or tough may retard labour occasionally, especially during the *second* stage, when, instead of *bursting and allowing the uterus to contract more powerfully* upon the child by the evacuation of the liquor amnii, they are pushed down into the vagina, forming a large conical sac, which may even protrude externally. We doubt much, however, if the *non-rupture of the membranes at the proper time during labour is of itself sufficient to retard its progress*; for it is frequently observed, that the head will nevertheless advance rapidly, and even be born covered by the protruded membranes.”† It is

* Page 207.

† Page 180.

quite certain that rupturing the membranes when the os uteri is dilated, and the pouch projecting into the vagina, does increase the power of the pains, precisely as the pains are found to alter after the liquor amnii has been discharged naturally. What hinders the uterus contracting powerfully upon the child must retard the progress of labour. Dr. Churchill denies their non-rupture causing delay, and yet subsequently inferentially admits it by stating, that when the pains are active and the os uteri is perfectly dilated, the remedy is obvious. Denman, before quoted, p. 16, admits its being a cause of delay; and Burns, that "there are circumstances in which it (the puncturing of the membranes) may be allowable, and is beneficial." With authorities thus differing and writing doubtfully, it is not to be wondered at that a means of relief should be so generally disregarded.

Chloroform importantly influences voluntary and involuntary motion, according to the extent to which it is administered. In natural labour its action should chiefly *indirectly* affect the muscles, by diminishing or withdrawing sensation, with scarcely a—if any—diminution of voluntary motion. The action of the abdominal muscles is partly voluntary and partly involun-

tary; that of the uterus involuntary, though influenced by mental emotions. Thus the woman can increase the expulsive efforts by bearing down powerfully, and can in a degree prolong them. Again, some women will struggle with their pains, and not fix the chest and bear down as they ought to do. By the removal of suffering, the resistance to it ceases without the necessity of increasing the dose of chloroform to the extent of stopping voluntary motion. Should, however, more be given so as to effect this, or even should consciousness be lost—although, as Dr. Snow has stated, this is unnecessary—still labour would not be retarded; on the contrary, it might be accelerated. And this is quite intelligible; for “these reflex movements can be best excited when the muscles are removed from the control of the will, which otherwise would generally antagonize them.”* Again, the emotional state being subdued, it can be understood how the action of the uterus may be increased by the inhalation of chloroform. “In regard to the act of parturition, there would seem reason to believe, from the evidence of cases of paraplegia, that, of the muscles whose operation is associated in it, the diaphragm, abdominal muscles, &c., are called

* Carpenter, p. 228.

into action (as in defecation) through the spinal cord; but that *the contractions of the uterus itself are independent of all connexion with the nervous system.*"* Therefore chloroform cannot directly check the action of the uterus. "It is an interesting fact, which has been more than once observed, that the foetus may be expelled from the dying body of the mother, even after the respiratory movements have ceased. This would appear due to the contraction of the uterine fibres alone, which, like those of the heart and alimentary canal, retain their irritability longer than those of the muscles supplied by the cerebro-spinal nerves; and the power of these would be unopposed by the resistance which they ordinarily have to encounter; since the tone of all the muscles surrounding the outlet would be destroyed by the cessation of the activity of the spinal system of nerves."† This is corroborated by Dr. Tyler Smith's experiment. "A guinea-pig was *nearly* killed with chloroform, and a stilette at once passed through the whole spinal marrow from the cauda to the cranium. But no spinal movement of any kind took place. Chloroform had obliterated excitomotor irritability. The spinal marrow was broken down entirely. Still the peristaltic ac-

* Carpenter, p. 153.

† Ibid. p. 153.

tion of the heart, intestines and uterus had not ceased. The heart and intestines both contracted and dilated as having to receive and transmit onwards their contents. The uterus only shortens itself as in the effort to expel its contents through the vagina. The uterus and intestines continued to act, moreover, after the beat of the heart had ceased. Thus there is, apparently, a definite order of dying in the different organs under the control of the ganglionic system. In the human system, the uterus evidently contracts so as to deliver its contents after both heart and intestines have ceased to act; it is the *ultima moriens* of the ganglionic system, just as the respiratory are of the spinal system.”*

To the loss of sensation succeeds voluntary motion, and to the latter loss of consciousness, and to this diminished reflex action, which at last extends to the respiratory tract, and which is known by the commencement of stertor; and if the administration of chloroform be unduly continued, death will result from *asthenia*—not from asphyxia.

Dr. Snow remarks: “Some objections had arisen from the supposed necessity of inducing a deep state of insensibility, and he was of

* London Med. Journal, Dec. 1849, p. 1109.

opinion that if it were requisite to cause the same amount of insensibility in midwifery as is required in operations in which the knife is used, that would be a valid objection, as he considered that this state could not be continued for two or three hours without injury to the patient. But this amount of insensibility was not required in obstetric practice, unless to arrest or diminish strong uterine action for a few minutes to facilitate turning the child. The suffering attendant on labour might often be greatly relieved, or even altogether removed, without suspending the consciousness of the patient.”* Unless the chloroform be administered to its full extent, as becomes necessary in obstetric operations, the action of the uterus cannot be impeded, and even then it is only temporary, because the ganglia of the sympathetic will continue the contractions; and also, as has been before stated, “the contractions of the uterus itself are independent of all connexion with the nervous system.”

The effects of mental emotion on the muscular contractions are familiar to every one, and it is often excited by the first appearance or presence of the accoucheur; hysteria, too, may also cause

* Med. Gaz. vol. viii. Feb. 2, 1849, p. 280.

the pains to subside for a time, or diminish their power. It is of no little value being able to control these by chloroform. The muscles of organic life "appear to be in the living body, much seldomer called into contraction through their nerves than they are by stimuli applied directly to themselves. The will has no power over them, and they would seem to be rather affected by those emotional conditions of mind which volition cannot imitate."* In such nervous states, tonicity is lessened and irritability is exalted, the two being in the inverse ratio to one another, as occurs with the palpitating heart, in the act of blushing, when the capillaries of the cheeks lose their tonicity and relax; or with the uterus, whose contractions are arrested for the time. With women in a civilized state, we find diminished tonicity and increased irritability. The nervous system is excitable; exalted sensibility exists together with less muscular development. Hence the pains are more acute, the physical strength is less, and the emotional condition is exaggerated.

Chloroform given in the first degree—only to stop sensation without removing consciousness—aims natural labour by diminishing or arresting suffering, from preventing its being retarded by

* Carpenter, p. 302.

emotional excitement, and I believe also from *generally* relaxing the tissues. Its valuable and marked effect in relaxing a rigid os uteri or unyielding perinæum, confirms this view of its action. As defective tonicity is accompanied with undue irritability, and greater emotional excitability, it might be thought that what relaxes the system generally would only make bad worse. Such however is not the case, for by its calmative effect it subdues the irritability which would relax the system far more than the chloroform. Again, emotional excitement arrests or checks the action of the uterus; chloroform may increase it, or if not, it certainly diminishes resistance, and renders less muscular action necessary. In the advanced stage of phthisis, the effects of general relaxation with feeble muscular power are occasionally seen, with the more rapid delivery of the woman. As has been before stated, the relaxed state of the system in civilized life facilitates labour, and compensates in a degree for the diminished muscular power, whereas in savage life the muscular power may be counteracted by the increased resistance resulting from the greater firmness of the tissues, exclusive of a greater amount of osseous development, and of the pelvis assuming the characters of that of the male. But it may be said

with an increased amount of relaxation existing in women in a state of civilization you give chloroform, which you admit increases relaxation? I believe that this is the only feasible objection to its use, for relaxation would favour the occurrence of hæmorrhage. I think it does increase the *tendency* of the latter; for although the effects of the chloroform soon subside, a state of relaxation continues, but far less in degree than what would result from the exhaustion of a severe labour, or from the nervous shock arising from the agonies endured. Certainly, in first deliveries, I have met with more cases of post-partum hæmorrhage with chloroform than without it. However, if means be possessed of preventing and controlling it, as I hope to show in a succeeding chapter, if this be an occasional sequence of it, still it would be no valid objection to its use.

Occasionally, though rarely, cases are met with in which the amount of suffering is so small as not to justify the administration of chloroform. These, however, are the exception to the rule. Mr. Roberton writes: "To induce a loss of consciousness in cases like these, would plainly be to diminish pleasure and enjoyment in the endeavour to assuage pain. If, then, I (Mr. Roberton) may assume that there are

labours in which chloroform is undesirable, I might add to this class a number who, although suffering considerably, would not willingly, that is, would not *desire* to be thrown into a state of unconsciousness in order to escape it. The truth is, that when the pregnant will submit to prepare themselves for what is before them, will be temperate in their eating, regular in their hours for sleep and for exercise daily in the open air, a considerable portion may secure benign labours. It is the sedentary and the luxurious who oftenest suffer severely in parturition. Of course there are many exceptions; but still much may be done to secure an easy labour, by care beforehand to have a calm circulation and muscles invigorated by daily exercise in the way of duty within doors, but especially in the open air.”* He also states: “I do not think the indiscriminate use of it in labour admits of even plausible justification; for why produce unconsciousness when to be conscious is to be happy? I have seen natural labour a time of happiness from first to last.”† The objection here is evidently incorrectly founded on the necessity of unconsciousness occurring, and of chloroform being given to the full extent as for a surgical operation. The administering of it in the first

* Page 460.

† Page 459.

degree, during "the pain and peril of childbirth," need not interfere with the happiness of consciousness, or prevent a woman enjoying "a time of happiness from first to last."

CHAPTER III.

AIDS TO MUSCULAR ACTION.

POSITION.—Whether a labour will be natural or instrumental, must in many cases depend upon the muscular power of the woman. It is of importance that she should be favourably placed for freely exercising it, and also for receiving the aid of the accoucheur; yet many women among the poorer classes are still delivered at the bottom of the bed, frequently not undressed, with stays on, and almost buried in the hollow of the sacking, and with the bed behind them.

The position of the patient for delivery should be adopted so soon as the “bearing pains” commence; this is particularly necessary when it is not a first confinement, as the progress of the labour may be unusually rapid. Abroad, and frequently in England, where women are confined at the bottom of the bed, as before mentioned, they lie on their back, and commonly in labour this is the position they incline to; but this precludes the accoucheur from aiding

her as much as he ought to do. Dr. Duncan Stewart, in his "Notes on the Medical Statistics and Topography of Calcutta," mentions that with native women, "labour is generally conducted in the erect posture, and it is not considered complete till the expulsion of the placenta, which is effected by force, the quicker the better, and often followed by dreadful hæmorrhage." The proper position for her is on her left side, with the means of fixing the pelvis with the feet. The legs being bent, she should either lie low enough in the bed to touch the foot-board, or if not, she should be able to press against a female attendant who can support the feet. A long towel, or some substitute for it should be attached by one end to the bottom of the bed, while the other is free, to be grasped by the woman during her pains, so as to enable her to fix the chest.

Light clothing—to permit freedom of action, and a well ventilated room are indispensable to prevent fatigue and exhaustion. The feather-bed, if possible, should be dispensed with, and the bed ought to be properly prepared. A clean under sheet should only extend a short distance from the bolster, and be folded so as to be able to be drawn down after the delivery without disturbing the patient. A folded blanket

covered with a piece of waterproof sheeting a yard and a half square over it, should be placed on the centre of the right side of the bed, the waterproof sheeting hanging a little over it, and a second sheet should then be placed over the bed up to the clean one. These arrangements whilst they are being attended to, accustom the patient to the presence of the accoucheur, and after delivery they save the patient being disturbed, which might produce hæmorrhage, or cause its renewal in a case of flooding. The same objects should be kept in view in the attire of the woman. A clean night chemise should be drawn up above the waist, and below and around it should be worn a second chemise and flannel petticoat. All is then made easily "comfortable" after delivery, by simply drawing away the second sheet and chemise, removing the bed-guards and drawing down the first sheet from the bolster, and the clean chemise on the woman. A blanket and sheet, or sometimes only the latter, afford sufficient covering. The temperature of the room should be attended to, care being taken that it is not too hot.

Protracted distension of the uterus by the retention of the liquor amnii, when the fluid-wedge of the bag of the membranes has done

its part may—as previously stated—prolong labour considerably with an unnecessary amount of suffering; and the discharging of the waters then adds too to the safety of the woman, from preventing the sudden emptying of the uterus, and the removal of pressure off the abdominal veins; which it will be shown is a cause of post-partum hæmorrhage. When the os uteri is well dilated with the presentation descending, and the pouch of membranes has descended half way down the vagina, the rubbing the nail to and fro across the protruding pouch will soon rupture it. This procedure will often shorten labour one or two hours, and only effects what nature usually performs.

Muscular contractions may be greatly aided by giving support during the existence of the pains. As has been previously stated, the abdominal muscles materially aid the expulsive efforts of the uterus, the *duration* of labour will depend much upon their assistance, and also the *termination* whether it will be instrumental or not. They are probably a means of inducing the contractions of the uterus, which “are independent of all connexion with the nervous system,” though influenced by it; certainly of increasing them.

The time taken for the passage of the head

through the pelvis is extremely variable, depending upon the strength, continuance, and frequency of the pains, the size of the head, its state of ossification, and the proportion its size bears to the cavity of the pelvis. The most efficient pains are equable, steady, and continuous, causing the patient to bear down with the breath held, the chest being fixed by an inspiration, and the diaphragm being made to descend, whilst the action of the levator ani and perineal muscles is overcome. The oblique, transverse, and recti muscles of the abdomen are excited to active contraction, the contents of the abdomen are compressed, the uterus is fixed, and its action powerfully aided. The patient in ordinary labour should be directed to bear down steadily, so as to prolong the contraction. Labour is often considerably prolonged, sometimes to become instrumental from the pains lasting only a short time, with a sudden jerking kind of effort, which effects but little. Pressure over the uterus besides aiding the contractile powers of the abdominal muscles, and being as it were a supplemental force to them, excites—as is universally admitted—contractions of the uterus, and also prolongs them; it is therefore a great aid in severe labour, and also in inducing active contractions. Of course when labour is

progressing rapidly, it would be an unnecessary interference during the time the head is being moulded to the pelvis, not but what even then, at the time of expulsion, such support—as recommended by Dr. Murphy—promotes subsequent efficient contraction of the uterus, and more rapid and easy removal of the placenta. The most rapid labours usually are met with in women who have had several children, and they are favoured by the relaxed state of the parts—as when chloroform is administered,—and such cases are frequently attended with hæmorrhage. Pressure on the uterus during delivery is an important means of averting this, by securing an efficient state of contraction. It is, however, in ordinarily severe labour, also when it is difficult, or when the pains are not efficient, that uterine support, or even powerful pressure on the uterus during the pains, avail so greatly.

Both in savage and civilized life, in labours, aid has been sought by external means. “Among the American Indians, for example, it is the custom in tedious labour *to fasten a belt round the abdomen of the patient*, and powerfully tighten it, with the view of *forcing out* the child; or the woman is lifted by her assistants, and violently shaken; or when other means fail, they bind a handkerchief over her mouth and

nose, and this, by causing a general convulsion, sometimes actually produces delivery. In similar cases among the negroes, Dr. Winterbottom says it is common to suspend the woman by the heels, with the view of altering the position of the child. They sometimes also, like the Indians, *compress the abdomen by means of a circular fillet* tightened with great force by a dozen assistants.”* Dr. Lee in some cases advocates the use of a binder before delivery. In Case 9, p. 183, where the patient “was on three different occasions attacked with dangerous uterine hæmorrhage immediately after the birth of the child,” Dr. Lee, “to prevent the recurrence of such a dangerous accident,” advised at the commencement of labour, “to discharge the liquor amnii by rupturing the membranes, and not to wait for the dilatation of the orifice; and on the pains becoming stronger, to apply the binder round the abdomen, and tighten it as the labour advanced—to leave the expulsion of the child entirely to nature—to avoid the use of stimulants, and preserve the apartment cool. This was done, and the uterus contracted after the delivery of the child, and the placenta was expelled without assistance in less than an hour, and so little hæmorrhage followed, that it was

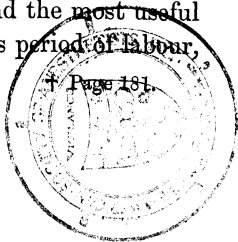
* Robertson, p. 487.

easily restrained by the application of a napkin soaked in vinegar-and-water. I (Dr. Lee) have repeatedly employed the same practice, with the most satisfactory results, in other individuals who had been repeatedly exposed to the greatest danger from hæmorrhage, after the expulsion of the child and placenta.”* Without entering into the question of the utility of rupturing the membranes before the dilatation of the os uteri, it may be remarked that pressure on the fundus uteri during the continuance of the pains, would be more in imitation of the action of the abdominal muscles than a continued pressure, which would tell less during their contractions, when the reverse is required. Dr. Churchill directs, “when the head is expelled, the nurse should be directed to make gentle steady pressure upon the uterus, and to follow it down, keeping her hand firmly upon it until the binder is applied; by so doing we shall rarely have any trouble or delay with the after-birth.”† Of course, what will aid the expulsion of the placenta will aid in the greater effort—the expulsion of the child. Dr. Murphy proceeds a step further. In his very able work he writes: “The plan which I have found the most useful and convenient to adopt at this period of labour,

* Clinical Midwifery, p. 184.

† Page 181.

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(when the head is distending the perinæum) is the following. To sit behind the patient as she lies upon her left side, the back of the chair being towards the head of the bed, and while the head of the child is pressing through the pelvic cavity, to press moderately with the left hand over the hip of the patient. Counter-pressure in this way employed is generally grateful to her, and seems to give her some relief; it assists also in keeping the pelvis fixed when the head is passing the perinæum, the most important part of this process. Having the left hand so employed, the right can be used to support the perinæum.”* This is a most valuable practical suggestion, for not only is the perinæum far better supported than it can possibly be with the left hand, but the contractions of the uterus are aided by the support to the abdomen. Supporting the perinæum with the left hand is an awkward and difficult procedure. Probably very often the intended aid is only an hindrance, for the perinæum should be *supported*, but not pressed upwards and forwards—as recommended sometimes—which would only check its dilatation, and might cause what is endeavoured to be prevented—laceration. The hand should be on the same plane as the os coccygis, and form

* Principles and Practice of Midwifery, p. 94.

as it were a continuation of it, for which purpose the right hand is just adapted. Authors of works on Midwifery dwell on supporting the perinæum, but supporting the uterus—except by Drs. Lee and Murphy—and aiding it, have not previously been advocated.

In ordinarily severe labour we may proceed a step still further, to that of giving support during the expulsion of the child. Such interference, however, would not be justifiable until the labour is energetic, and not whilst pains are long distant, and the patient sleeping in the intervals. When, however, the head is fairly engaged with the pelvis, and the pains are severe, *pressure* on the fundus uteri, downwards and backwards, will greatly aid the labour. When the woman is struggling hard, and the head is progressing slowly, if it continue to advance, it may be with exhaustive suffering to the patient; too often do the pains begin to alter; the power of bearing down diminishes; they become perhaps less frequent, or if not their character is changed; they then, as it were, relapse to the first, or “grinding” pains, and symptoms of exhaustion set in. Under these circumstances, Dr. Murphy recommends “a *moderate* dose” of opium. “The object which it is intended to accomplish by opium, is

to subdue the nervous irritation which precedes exhaustion, and to restore by rest the energy of the uterus." "After a temporary rest has been thus produced, if the uterus still continues to act feebly, ergot of rye may be given in an equally cautious manner, carefully attending to its influence on the pulse, and especially on the circulation of the foetus. If, in either case, after giving this medicine, the rate of the pulsations be diminished, you must not persevere in its employment, otherwise the death of the child may be the result."* Dr. Beatty's rule is, that it should not be given more than two hours before the probable expulsion of the child. The cases most suitable for it, are those in which the pains are short, feeble, and perhaps infrequent, and where the delay of the labour is due to want of power of the uterus, and not to a disproportion between the pelvis and the child's head. If given in the latter case, the death of the child will probably ensue. According to Dr. Harvey's table of forty-eight cases in which ergot of rye was given, thirty-four children were still-born. Should, however, the head become arrested, the application of the forceps becomes necessary, or even if exhaustion occur. The use of the forceps is always to be avoided if possible,

* Murphy, p. 140.

for "the post-partum accidents of labour follow operations with the forceps more frequently than cases which are left to themselves."* Independent, too, of lacerations of the vagina and perinæum, and recto-vaginal or vesico-vaginal fistula occurring, the deaths of mother and child are sufficiently frequent to deter their unnecessary use. Dr. Churchill states, "that in 799 cases, fifty-four mothers were lost, or about one in fifteen; and in 899 cases, 184 children were born dead, or about one in five."† Therefore to increase muscular action, and to avert exhaustion, ergot is given, which endangers the life of the child; and when the head is arrested, or exhaustion threatens, the forceps are applied, the use of which is dangerous to the mother and child.

It is, then, an object worth attaining, to increase muscular action, without exciting it to an inordinate and uncontrollable degree, as with ergot; and to avoid a supplemental power, dangerous more or less in its application, as with the forceps. We have to render it efficient, too, when weakened from impaired physical development. It has also been shown how importantly the abdominal muscles aid by compressing and fixing the uterus. As

* Murphy, p. 151.

† Page 291.

the contraction of the abdominal parietes is simultaneous with that of the uterus, it follows that pressure should co-exist with these contractions. To use this rightly, it is necessary to know how the contractions of the uterus occur, or the order in which they happen; and this is a disputed point. Thus Dr. Rigby adopts Wigand's views, who writes: "In examining the course of a true pain, we shall find that the contractions of the uterus do not begin in the fundus, but *in the os uteri*, and *pass from one to the other*. Every pain which commences in the fundus is abnormal, and either arises from some derangement in the uterine action, or is sympathetic with some irritation not immediately connected with the uterus, as from colic, constipation, &c. We very seldom find that a contraction of the uterus, which has commenced in the fundus, passes into the cervix and os uteri, and becomes a genuine effective pain; usually speaking, the contraction is confined to the circumference of the fundus, without distending the foetus at all. When a genuine pain comes on, so far from the head being pressed against the os uteri, it at first rises upwards, and sometimes gets even out of reach of the finger, whilst the os uteri itself is filled with the bladder of membranes: if it had commenced in the fundus in-

stead of in the inferior segment of the uterus, so far from the head being drawn up at the first coming on of the pain, it would have been forcibly pushed down against the os uteri. In the course of a few seconds the contraction gradually spreads over the whole uterus, and is felt especially in the fundus; the head, which had been raised somewhat from the os uteri, is now again pushed downwards to it, and seems to act as a wedge for the purpose of dilating it; it is not until the whole uterus is beginning to contract that the patient has a sensation of pain. We may, therefore, consider that a genuine uterine contraction consists of certain phenomena which occur in the following order:—first, the os uteri grows tight, and the presenting part rises somewhat from it; then the rest of the uterus, especially the fundus, becoming hard, the patient has a sensation of pain, and the presenting part of the child advances.”*

If these views be correct, pressure on the fundus uteri, at the commencement of a pain, would only excite irregular contraction, and it ought to commence low down towards the cervix and pass upwards to the fundus. Dr. Murphy remarks:—“In Wigand’s explanation, the influence of fluid pressure seems to be altogether for-

* Rigby, p. 99.

gotten. The immediate effect of contraction commencing at the fundus would be to compress the liquor amnii, which of necessity forces its way before the head, on to the mouth of the uterus. The fluid in this position re-acts against the head with the same power that it is compressed, and therefore pushes it up until the increasing contraction of the fundus forces the head down again, so that you perceive the phenomena quoted are quite consistent with the statement, that uterine contraction begins at the fundus; in fact, it could not be otherwise, so long as the waters remain in the uterus. But if the contraction commenced from below, the fluid must be driven upwards towards the fundus, and that portion between the os uteri and head pressed aside, at least in the first instance, so that the head might be easily felt when the pain commences, although not so afterwards; but the reverse is the case, and you will find that in those cases where the liquor amnii is in large quantity, it is difficult to feel the head at all, except in the interval of the pains.”*

To aid muscular action when weak, to increase its power when greater resistance than usual arises, to avoid the use of ergot of rye, and to prevent exhaustion and instrumental aid,

* Page 53.

pressure on the uterus, at the fundus, will be found greatly to assist its action, and consequently the progress of the labour. I feel convinced that steady, persevering pressure with each pain for two or three hours, has in my practice averted instrumental aid. At the height of the pain, I have in severe labour—particularly with first confinements in women advanced in life—used sufficient force to draw the patient somewhat towards me, when she was in her agony drifting to the other side of the bed. Pressure will not only be found to increase the power of the contractions of the uterus, but also to prolong them. It should be regulated to the amount of contraction during the pain, increasing, diminishing, and ceasing with it. The woman will feel sensible of this aid, and earnestly desire its continuance. It is equally valuable when chloroform is administered; in fact, more so; for from the relaxation produced by it, the pressure renders the contractions more efficient, the chloroform diminishes the resistance, and instrumental aid with forceps is less frequently required.

The dangers resulting from protracted labours both to mother and child have been before referred to, page 13; also those arising from the ergot of rye being given to increase the mus-

cular contractions, page 48; and those too in cases where nature fails in her efforts, and the use of the forceps becomes necessary, page 49. Reference has been made to contrivances adopted in savage life for aiding labour by compressing the abdomen, page 43; and in civilized life to a bandage used during labour, by Dr. Lee, and also the late Dr. Merriman, for averting post-partum hæmorrhage, as well as discharging the liquor amnii before dilatation of the os uteri; to Dr. Churchill's plan of using "gentle steady pressure upon the uterus," to aid the expulsion of the placenta; and to Dr. Murphy's method of supporting the uterus and perinæum during the expulsion of the child.

Suppose then, that a labour commences favourably, that the pains are active, regular, and continued; that all apparently is going on well, and yet with a well-formed pelvis that the head makes little progress. The accoucheur finds nature acting; he trusts to her; the labour may continue to progress with great suffering and exertion; or the strength of the patient may begin to fail, and the pains alter in their character: in the former case all will end well unless hæmorrhage succeed—not an improbability, as the result of general exhaustion; in the latter, aid becomes necessary, probably instru-

mental. Now, compressing the uterus has been shown to increase its action. It has been shown how the abdominal muscles aid it, page 10, and how their development, and muscular development generally, is impaired by unnatural restraint, page 17, and that want of muscular power is a main cause of difficult labour, page 15. Why then not aid struggling nature, and relieve suffering, particularly too if the patient's safety be promoted thereby? It may be said, quick labours are bad, true, in such cases it would not be required: still protracted labours are worse, and more endanger both mother and child. Without labour being shortened by violence done to nature, it may be safely aided and curtailed, and in some cases prevented from being instrumental. The chief dangers of a quick labour are laceration from too rapid expulsion, and hæmorrhage, from the uterus continuing to contract and relax after the birth of the child. Pressure is advocated during the moulding of the head, before the expulsion of the child, to aid the power of the uterus, and during it, if it be difficult or not too rapid; in the former case to assist its passage, in the latter to promote contraction and avert hæmorrhage. Even if the birth be rapid, this pressure and following down the contractions of the uterus *as the child escapes*

is useful to secure contraction, and by continuing it, to prevent subsequent relaxation and hæmorrhage. It has been stated that Dr. Lee uses pressure, by means of a binder, during labour, the objection to which is made in page 45, for averting hæmorrhage. Whatever aids in securing a good contraction must be a means of preventing hæmorrhage. Pressure, as recommended by Dr. Churchill for aiding the expulsion of the placenta, must aid too in the expulsion of the child. Dr. Murphy advises, when the head is distending the perinæum, supporting the uterus and pressing it moderately until the expulsion of the child. What aids the termination of the second stage will also aid earlier; for it is the difficulties of this stage that are the cause of protracted labour. I would suggest in all cases, save very rapid ones, pressing the uterus with more or less force, according to the severity of the labour, during the pains. It should however, be moderated when the head is distending the perinæum, so as not to hasten labour before this has occurred, for fear of inducing laceration. We thus imitate nature; for at this time the pains usually diminish in their force and frequency, prior to the last great expulsive efforts. We may then aid greatly when the dilatation has occurred, and when the head is

advancing and receding, or for awhile stationary. Even to save one severe pain at this time is worth attempting.

I have entered more minutely into the matter of using pressure during the second stage, from the fact that authors generally discountenance any aid in natural labour, save supporting the perinæum. The importance of this aid has been unduly exaggerated. I heard of one case of a student, who was so impressed with the necessity of doing this, that on going to a labour, the first thing he did on reaching the bed-side was to kneel and commence pressing the perinæum, forgetting previously to examine the woman to ascertain the state of the labour, which had but little advanced. He did this for several hours. Of course this was very gross ignorance; still, probably, the exaggeration of an aid, or supposing this was all that could be done, took possession of his mind. The exaggeration of a difficulty from premature discharge of the liquor amnii, has prevented aid being rendered, when retention—although denied as being such—will pretty generally be admitted, as a cause of delay. We have seen that Dr. Lee does not hesitate to rupture the membranes when post-partum hæmorrhage is feared, although the os uteri is not dilated. Such an interference with nature I have

not advocated, but only the imitation of nature, and accomplishing what she should effect; so pressure, too, used during the pains is similar in principle.

Against the foregoing, Denman, an authority worthy of great consideration, writes:—
“ Women should be informed, that the best state of mind they can be in at the time of labour is that of submission to the necessities of their situation; that those who are most patient actually suffer the least; that if they are resigned to their pains, it is impossible for them to do wrong; and *that attention is far more frequently required to prevent hurry than to forward a labour.* In everything which relates to the act of parturition, nature, not disturbed by disease, or molested by interruption, is fully competent to accomplish her own purpose; she may be truly said to *disdain and abhor* assistance. Instead therefore of despairing, and thinking they are abandoned in the hour of their distress, all women should believe and find comfort in the reflection, that they are at those times under the peculiar care of Providence; and that their safety in child-birth is insured by more numerous and powerful resources than under any other circumstances, though to appearance less dangerous.”* This is excellent advice for the

* Vol. i. p. 342.

patient, and as regards the natural powers would be pretty true were women brought up more in accordance with nature ; not but what in savage life difficult labours have been stated to be as frequent as in civilized, page 4. Again, Denman writes:—"Whoever has reflected upon this subject, would hesitate as much to believe, that, in the general dispensation of Providence, it should have been left to human skill, to guide the head of the child at the time of birth in a direction different from that in which it most commonly presents, as that it could have been intended for the generality of children to have been brought into the world by instruments or by any human invention."* Yet a little further on, with seeming inconsistency, he states, "I am convinced, that the most effectual method of preventing a laceration, or any injury to the parts, is to be found in the single principle of retarding, for a certain time, the passage of the head of the child through them. This retarding may depend on the composure of the patient and the skill of the practitioner; and those errors of which the former might be guilty, the latter must endeavour to obviate and correct."† Subsequently, in his directions for guarding the perinæum, he advises "the operator to resist the progress of the head of the child, during the

* Vol. i. p. 362.

† Ibid.

time of a pain, by placing upon it the fingers and thumb of the right-hand, so formed that they may bear on many points; or to apply the balls of one or both thumbs in such a manner that they shall at the same time support the *fourchette*, or thin edge of the *perinæum*. But in first children, when, from the vehemence of the patient, the strength of the pains, and the rigid state of the parts, there is great reason to apprehend a laceration of the *perinæum*, then, occasionally calling in the other means to our aid, we shall be able to give the *most powerful* and effectual support, by applying the palm of the left-hand, covered with a soft cloth, over the whole temporary and natural *perinæum*, and the right-hand employed as was before mentioned, *with a force competent to resist the exertions of the patient* during the violence of the pain.”* No more active interference than this could be well advocated, and is strangely inconsistent with the remark that nature “may be truly said to *disdain and abhor assistance*.” “The vehemence of the patient” is spoken of as if it were voluntary, and it is a question which I should think one would not be justifiable in solving, whether the interference advised would not be likely to cause laceration by undue distension of the

* Vol. i. p. 365.

perinæum. Evidently for once, Denman was a tamperer with nature; for, describing the methods of managing the perinæum, he mentions "a trial of them all, perhaps not always very justifiably, &c."* To use "a force competent to resist the exertions of the patient" would probably cause the expulsive power to tell more directly upon the perinæum; whereas, nature unrestrained, but aided by suitable support to the perinæum, might do no harm. These cases of rapid birth are a difficulty requiring unusual vigilance upon the part of the accoucheur, from no gradual distension occurring: in such, I believe chloroform is most valuable in assuaging the terrible and maddening pains that *then* occur and in preventing laceration, by its relaxing effects upon the perinæum. Of course, under these circumstances, any pressure upon the uterus, until immediately after the expulsion of the child, would be injudicious. I do not think that Dr. Denman's remark, "that attention is far more frequently required to prevent hurry than to forward a labour," will coincide with the experience of accoucheurs generally. Certainly he did not seem to regard the saving of suffering. The fatality both to mother and child in difficult labours has been adverted to, page 13.

* Vol. i. p. 363.

The time that I select for aiding the contractions of the uterus, is, when the "bearing pains" are well established, and the head is fairly engaged with the cavity of the pelvis. I prefer sitting at the edge of the bed to a chair, as recommended by Dr. Murphy; for often the chair is too low to enable the accoucheur to support the abdomen; and if not, the leaning forwards for a much longer period of time than may be required for the support of the perinæum, would greatly fatigue: moreover, the same amount of power could not be exercised. The position of the accoucheur must be regulated according to whether chloroform be used or not. It will be found very convenient to have a chair close to the bed, on which can be put scissors, thread and bandage; and to sit side-ways, with the left leg bent under the right one, which can be supported by a cross-bar of the chair. The accoucheur can then watch the countenance of the patient—a main guide in the use of chloroform, which will presently be referred to. He can easily from time to time feel the pulse; he can press on the abdomen with little fatigue; and he can at the same time conveniently support the perinæum. When the patient, as is commonly the case, begs to have her back supported, the left knee, with a pad inter-

vening, can readily give this aid. In no other way can the accoucheur do so much : the patient, too, cannot glide away to the opposite side or to the bottom of the bed, and get beyond his reach. The left hand should be placed on the fundus uteri, and pressure, varying in degree according to the nature of the labour, be used during the pains, in a direction downwards and backwards, and diminishing with the subsidence of the pain. If the woman have not much power to bear down, as may occur in cardiac or pulmonary disease, aid in this manner should be given early, and continued till delivery. Usually the patient bears against the hand, and this may be sufficient, except in cases of difficult labour, when greater force may be advantageously applied. At the time of expulsion the hand must follow down the contractions of the uterus, and when delivery has occurred, the nurse's hand should replace that of the accoucheur ; this is useful in all cases, even in those of rapid birth, as it aids in effecting a good contraction, and, consequently, in preventing hæmorrhage. The pressure on the uterus should not anticipate the pains ; sometimes the accoucheur is requested to desist, particularly if the pain have not well set in, as, from its increasing the contractile power of the uterus, it makes the pains worse—an evi-

dence of its utility. When chloroform is not used, the accoucheur can sit at the edge of the bed with his back towards the head of it, instead of sideways as before mentioned.

The perinæum should be *supported*—not strongly pressed against—so soon as it begins to suffer distension. “A single fold of a fine napkin should be placed along the edge of the perinæum, and the right hand so applied that the fold of the skin between the fore-finger and thumb should correspond to this, the fore-finger and thumb passing on either side of the vulva, and the palm of the hand, resting against a thicker fold of the napkin, applied to the posterior part of the perinæum;”* or, as I prefer, the palm of the hand supporting the perinæum, the index and middle fingers can be quite sufficiently separated for them to be on either side of the vulva. In this latter way I believe the perinæum is more equally supported, and the advance of the head more readily discovered. Naegelè remarks, that when the patient lies upon her left side, there is “no position which favours the manner in which the head passes through the outlet of the pelvis (and which I (Naegelè) have just described) so much as this, and which is so beneficial and

* Murphy, p. 95.

certain for the mother. *Under these circumstances, any supporting of the perinæum is unnecessary, and the attention of the accoucheur is not disturbed,*" &c.* Thus extremes meet: we have the cautious Denman, and subsequent writers, dwelling so much upon it, and Naegelè considering it unnecessary. The truth will probably be found in the mean, as too much pressure—particularly if applied in a wrong direction—will, as well as distension unaided, favour laceration. "The object in view is to obviate the effects of too violent distension. The pains at this time are very unequal, sometimes weak and again very strong; you support the perinæum against the latter by moderate counter-pressure to prevent accidents; but against the former no such precaution is necessary: you must not, therefore, press with every pain indifferently, but only when the uterus is acting with great force."†

In cases of obliquity, or anteversion of the uterus, arising as they do from the want of support of the abdominal parietes, producing more or less "pendulous abdomen," the treatment must be such as to correct this mal-position. In such the action of the uterus is misdirected,

* On the Mechanism of Parturition, p. 27.

† Murphy, p. 96.

the misdirection being proportionate to the degree of displacement. It is necessary for the contractions of the uterus and its fundus to tell, that the os tinæ should be opposed to the latter, and in the right axis of the cavity of the pelvis. It has been previously stated, p. 20, that obliquity of the uterus is more frequently a cause of delay than is generally supposed, and may fail to be detected by an external examination. If on making an examination the os uteri cannot be felt, without pressing the fingers upwards and backwards towards the promontory of the sacrum, and the head is distinctly felt with the distended anterior lip of the os uteri, or rather of the anterior inferior portion of the uterus over it, the state of the case is evident. Without, however, the obliquity existing to this extreme degree, the os uteri may be found inclining towards the sacrum; it then acts as an impediment—although often a slight one—to the contractions of the uterus: then, the inclination of the os uteri may be the only evidence of obliquity existing. The contractions of the uterus increase the obliquity, from its fundus being tilted forwards during the pains.

The treatment must be such as to make the axis of the uterus correspond with that of the upper part of the cavity of the pelvis, and not

with the axis of the brim as mentioned by Dr. Churchill, p. 208; for in the axis of the brim, a "line would touch the hollow of the sacrum, near the coccyx, in one direction, and would pass out below the umbilicus in the other."* This would manifestly be an oblique position for the uterus, and which would be increased by its contractions. It is recommended in these cases to place the patient on her back; but with relaxed abdominal parietes there is nothing to prevent a lateral obliquity occurring. Moreover, the want of support from the abdominal muscles ought to be supplied. Dewees recommends the abdomen being raised by "a long towel placed against it, and kept in the position we had carried it by the hands, by its extremities being *firmly held by two assistants*: at the same time we introduced a finger within the edge of the os uteri, and drew it towards the symphysis pubis."† The most simple, easy, and efficient plan, will be found in using a jack-towel passed below and partly over the abdomen, with its ends directed obliquely upwards and backwards to the waist, and twisting the two together tightly: with each pain the coil of the towel may be tightened, and drawn in the direction of it either by the accoucheur or nurse. By

* Murphy, p. 11.

† Page 224.

this means not only is the mal-position of the uterus corrected, but also the support that the abdominal muscles ought to give, is afforded. When the head is thoroughly in the cavity of the pelvis, the pressure of the left hand—as previously described—will be all-sufficient.

Chloroform may be called the great aid in midwifery. Such an one was desired by Burns, who writes: "A fundamental principle, then, in midwifery is, that relaxation, or diminution of resistance, is essential to an easy delivery; and could we discover any agent capable of effecting this rapidly and safely, we should have no tedious labour, excepting from the state of the pelvis or position of the child. This agent has not yet been discovered. Blood-letting does often produce salutary relaxation, but it cannot always be depended on, neither is it always safe."* Fortunately, however, chloroform in producing relaxation at the same time arrests sensation, and prevents increased irritability. It checks, too, emotional excitement, and thus indirectly may accelerate labour.

It has been previously stated (p. 30) that "the contractions of the uterus itself are independent of all connexion with the nervous system," though influenced and aided by it.

* Page 362.

Hence chloroform cannot arrest its action until *asthenia* occur. It may and very commonly does at first check it, from its calmative effect on the nervous system, and consequently from its temporarily depriving the uterus of its previous stimulus, as when it interferes with reflex action, known by stertor occurring. The sympathetic system is subsequently influenced if the chloroform be continued, known by the failure of the pulse. This of course is always to be avoided, as here is the danger of it. Therefore, if reflex action be arrested, still the ganglionic system is intact, and by it and the independent action of the uterine fibres the contractions still continue. However, in natural labour the reflex action should not be interfered with, and stertor should not be produced. The peculiarities of the muscles of organic life are, that they are more stimulated through their fibres than through their nerves; whereas the reverse is the case with the muscles of animal life: "The ganglionic nerves much sooner lose their power of exciting these muscles (of organic life) to contract when themselves irritated, than the muscles lose their power of contracting when directly stimulated."*

Chloroform aids the contractions of the uterus

* Carpenter, p. 301.

when given in the first degree, to affect only the cerebro-spinal system, by removing emotional excitement, which has a paralyzing effect on the muscular fibres of the uterus ; and whilst it relaxes generally the muscular system, this relaxation is not accompanied, as in all other cases when tonicity is diminished, by a proportionate increase of irritability ; and thus the exhaustion both from nervous excitement and pain is avoided. It is this that makes chloroform so particularly valuable in the practice of midwifery.

The time for administering chloroform must depend upon the circumstances of the case, and the judgment of the accoucheur. In cases of tedious labour arising from hysterical excitement, it will be required to be given early. Here it is the greatest aid to the accoucheur, for under these circumstances, as Dr. Murphy truly remarks, "the practitioner has often to undertake the management of a case far more embarrassing than those in which mechanical impediments obstruct delivery."* So again, too, in mental despondency ; for, as has been before remarked, chloroform is capable of controlling emotional excitement, and its consequent paralyzing effects on the uterus. Ordinarily,

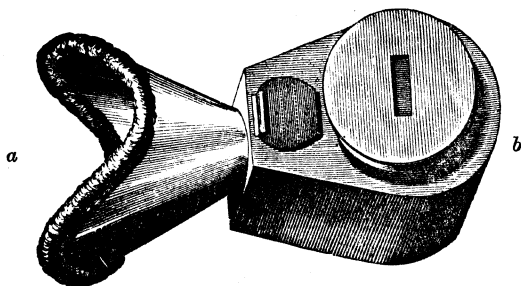
* Page 109.

the time for commencing its use is when true labour or "bearing pains" have set in, and the head is being moulded to the cavity of the pelvis.

The mode of administration varies. Accoucheurs would now join with Dr. Snow in disapproving "of Dr. Simpson's plan of giving chloroform on a handkerchief, and more particularly of his practice of putting three or four drachms on the handkerchief to begin with. To show the danger of this practice, he (Dr. Snow) alluded to the fatal cases published, and read some notes, furnished to him by Mr. Henry Smith, of a case in which the patient very nearly lost her life from chloroform given in this manner preparatory to an operation."* In midwifery chloroform is used in different degrees. When it is desired to produce a state of sopor, as in instrumental cases or in turning, the handkerchief might be used; but when it is given in small and repeated doses, as in natural labour, it is not suitable. An inhaler then becomes necessary, of which there are various kinds. Dr. Sibson's is a very compact instrument, but the objection to its use in ordinary midwifery practice is, that the chloroform escapes during the time it is not required through the wire

* Med. Gaz. vol. viii. Feb. 2, 1849, p. 208.

gauze covering the chamber containing the chloroform sponge. Dr. Snow's is another orinasal inhaler, and is faultless as such, but from its size is not convenient in natural labour. The one most easy of application I believe to be Dr. Murphy's, which is applied to the mouth only:



a. Mouth-piece.

b. Chloroform chamber.

The opening connecting the mouth-piece and chamber is closed by a cork stopper, and thus the escape of the chloroform when the inhaler is not being used is prevented. It is made by Mr. Coxeter, of Grafton-street, for 6*s.* 6*d.*, or if plated, 12*s.* 6*d.* The chloroform should be administered so as to diminish or remove suffering—at least almost so—without loss of consciousness and voluntary motion. In this way its use may be continued for several hours with perfect

safety. The chamber should be charged with about three quarters of a drachm of chloroform, and it should be held by only the fore-finger and thumb, so as not to heat it unduly.

Dr. Murphy, in his "Lectures on Midwifery," directs "the inhaler to be applied to the mouth just as the pain commences;"* and in his smaller work on "Chloroform in Childbirth," "just before the pain commences."† The first application of the inhaler will often excite a spasm of the glottis, when it should be momentarily withdrawn. It should be applied immediately the patient rouses up, so as to get her under its influence before the pain sets in. Moreover, from the bearing down and the fixing of the chest, the chloroform cannot be inhaled during the full force of the pains.

The guides to the administration of chloroform in natural labour are the pulse, the breathing, the countenance, and the voice. The pulse is of not so much importance when inhalation is only continued for a few seconds at a time. It should, however, be felt during the intervals of the inhalation, when the accoucheur has nothing else to do; and any failing of it would guide its being withheld during the ensuing pain; for the cumulative effect of chloroform

* Page 470.

† Page 70.

should not be forgotten. Dr. Snow remarks :
“ Some persons direct their attention too exclusively to the pulse while giving chloroform. If the vapour were sufficiently diluted with air, it would exert no great influence over the pulse, even if it were continued till the breathing should cease ; and if it were not sufficiently diluted it might stop the pulse suddenly, without previous warning, when the information would come too late. The pulse is, therefore, but of secondary importance, as an indication of the effects of chloroform. The breathing, and the state of the eyes and eyelids, afford the best indications of the condition of a patient under chloroform. The cause of accident has always been, that the vapour, being too strong, has acted so quickly, that there was not time to judge of its effects. . . . When the air a person breathes does not contain more than four or five per cent. of vapour of chloroform, insensibility is induced very gradually ; and I (Dr. Snow) have found in numerous experiments on animals, that when vapour of this strength is continued till they are destroyed, death takes place very slowly. The breathing first becomes embarrassed, and then ceases ; but the heart continues to beat for one or two minutes afterwards. During this interval, the animal can be easily

restored by artificial respiration; and it often happens that, when the action of the heart is about to cease, the animal makes a gasping inspiration or two, which renew the circulation and cause spontaneous recovery, if the chloroform is not continued. On the other hand, when animals are made to breathe air containing eight or ten per cent., or upwards, of chloroform, death takes place very quickly, and the circulation of the blood is arrested at the same time as the breathing, and indeed in some cases before the breathing. A very few inspirations of air, containing ten per cent. of vapour of chloroform, have the effect of paralyzing the heart.”* Where there is a weakened action of heart, as accompanies fatty degeneration of its muscular fibres, or when strong emotional excitement occur, the vapour of chloroform, if not well diluted with atmospheric air, or if given too quickly or too long, may stop the heart’s action before respiration ceases. Dr. C. J. B. Williams remarks that under “strong mental emotion or acute sensation, the heart most remarkably suffers from such causes. Thus a sudden shock, whether of grief, surprise, fear, or even joy, may cause fainting, partial suspension of the action of the heart; nay, even death has ensued; and the ex-

* Med. Times and Gaz. 1853, vol. ii. p. 485.

pressions 'frightened to death,' and 'killed with joy,' are not always mere figures of speech."* In a fatal case at St. George's, in which Dr. Snow's inhaler was used by Mr. Potter with every precaution, it is mentioned that "on entering the operating theatre she appeared very nervous. There were respiratory efforts subsequent to the complete cessation of the heart's action, and at the autopsy the cavities of that organ were found distended with the blood, which they had been incompetent to propel." "The heart was small and fat, the right ventricle being especially loaded with adipose material, and its muscular layer much thinned. Under the microscope there was found to be slight yet decided fatty degeneration of the muscular structure." "Probably the heart had been organically feeble, and had yielded in part to the nervous depression in which the patient was at the time, and in part to the influence of the poisoned blood. The case is very remarkable on account of the small quantity of the anæsthetic which had been inhaled. Only a drachm had been originally employed, and of that, considering that not more than a minute and a half had elapsed, throughout the whole of which the valve had been so turned as to admit freely atmospheric

* Principles of Medicine, page 26.

air, it is not probable that more than a very small proportion had actually been received into the patient's system. The universally fluid condition of the blood must, however, be taken as proof that that little had exerted a powerful influence."* The position of the patient was "half-reclining." Death has probably occurred entirely from mental emotion, for two or three moderate inspirations of well-diluted chloroform vapour could not produce it. It would be well if the pulse and state of the patient just before the administration of chloroform were always carefully examined; and when a weak excited pulse exists, to endeavour first to tranquillize the system by a diffusible stimulus; then to accustom the patient to the chloroform inhaler by using it for a moment or two and withdrawing it, and endeavouring to restore confidence as much as possible. In natural labour, the emotional excitement tells upon the uterus; there is usually the fear of the labour, and not the fear of the chloroform; and the recumbent position of the patient is in favour of the action of the heart. Still, at first the accoucheur cannot be too cautious; it is far better for the patient to express dissatisfaction at not experiencing the relief that she expected, than to

* Med. Times and Gaz. 1854, vol. i. p. 516.

produce a well-marked effect at once. Mr. Robertson justly remarks: "Chloroform is a powerful agent, just as opium is a powerful agent. When administered in proper quantity, and there is a due admixture of atmospheric air, the effect is benign; but when given in the *ad libitum* manner of some, what wonder if death or alarming consequences follow?"* We may then come to the following conclusions:—

1st. That the pulse may cease before respiration; or in other words, that the "respiratory efforts" may be "the latest evidence of remaining vitality," as in the fatal case at Guy's, reported in *Med. Times and Gaz.* vol. ii. p. 591. 1854.

2nd. That the pulse and respiration may cease at the same time, as in the fatal case at the Middlesex Hospital.—*Ibid.* p. 87.

3rd. That an emotional state may produce a fatal syncope, or may cause such depression as to permit of a small dose of chloroform vapour, sufficiently diluted, increasing it to a fatal extent—as in the fatal case at St. George's.—*Ibid.* vol. i. p. 516.

4th. When the pulse fails, it does so suddenly; so that it is merely an evidence of the state, without being a warning for its preven-

* *Med. Times and Gaz.* 1853, vol. ii. p. 461.

tion.—Ibid. vol. ii. pp. 87 and 591. 1854; vol. i. p. 572. 1854.

Although the pulse fails to be of much practical value during the administration of chloroform, still it is a most valuable guide, not only prior to its inhalation, but in the intervals, during the absence of the pains. Before a surgical operation there is the dread of it, and perhaps of the chloroform too, producing more or less emotional excitement, influencing the action of the heart; under these circumstances, the chloroform is given to its full extent. In natural labour the case is very different. If emotional excitement occur, it will act mainly on the uterus. Ordinarily, from the gradual progressive advancement of the labour, it becomes a fact; the suffering is severe, and aid is eagerly sought. Again, the vapour of chloroform is at first administered in so slight a degree, as to render any accident impossible with ordinary precautions. Still, as it may be used for several hours, and with perfect safety too, its accumulative powers should never be lost sight of, and of which the pulse will be an unerring guide. Stimulating drinks are forbidden in natural labour; when, however, chloroform is used, I invariably give, every now and then, either wine or brandy-and-water, in moderate quantity, so as to guard

against any depression. Even when given in the slight degree only necessary in natural labour, it is no uncommon thing for the patient to complain of vertigo and debility, when the pulse does not evince it. Yet, when the chloroform is administered gradually, and well diluted with atmospheric air, it will, if taking too powerful an effect from its cumulative property, depress gradually the pulse, and thus clearly indicate such a state occurring.

When, however, the chloroform is given sufficiently diluted, and it is not allowed to accumulate, the heart is never affected before the breathing: in other words, the spinal cord would first become paralysed, and reflex action extinguished, with the forerunner of stertor, before the ganglionic system, or the heart was affected, or *necræmia* occur. Thus in a fatal case that occurred at University College Hospital, "a loud rough stertor"* occurred, preceded by convulsive action. The frequent occurrence of struggling, and a fatty degeneration of the heart existing in fatal cases, aid in accounting for death by asthenia, or as it may be called, cardiac syncope, or syncopal asphyxia. In the record of fatal cases, the absence or presence of stertor is not sufficiently often mentioned. When

* *Med. Times and Gaz.* vol. ii. p. 422. 1853.

chloroform is given to its full extent, the breathing is a most important guide for its continuance; so important is it, that it has been considered by Mr. Clendon, Professor Syme, and others, as alone sufficient: and this to a certain extent is true, for the countenance may fail to warn one of the danger, as in the fatal case above referred to, in which "the face of the patient was only slightly altered." Requiring, however, to be given in so slight a degree, as insisted upon by Professor Murphy, stertor should never be allowed to occur; consequently, watching the respiration when chloroform is being inhaled, is only useful on this account.

The countenance and voice are the main guides *during* its inhalation in natural labour, and the pulse in the intervals of the pains. When suffering is assuaged, the countenance is *placid* and the voice *plaintive*. The patient will probably, in a dreaming kind of state, talk of the severity of her pains, when afterwards she will tell you that she scarcely, or not at all felt them. The eagerness, too, of the woman under these circumstances to inhale the chloroform sufficiently soon, is most marked, and this demands the utmost vigilance on the part of the accoucheur, although Dr. Murphy's inhaler, by leaving the nostrils free, allows of partial respira-

tion through them. He writes, "I have been in the habit of using an inhaler that is applied only to the mouth, which seems to me the safest mode of administering chloroform that can be adopted, although not the best, if the full power of the vapour is required. Chloroform may be given either to lull the pains without disturbing the consciousness of the patient, or to remove all pain by inducing sleep. The first mode is applicable to ordinary cases of labour; the second is used in some severe obstetric operations. The inhaler that I allude to accomplishes the first object perfectly, because the vapour which enters the lungs is so much diluted with atmospheric air, that its power is greatly weakened; nor, until the inhalation has been continued for some time, does it cause anything like sopor. This may be understood, if we reflect that the nostrils are the channels through which respiration is chiefly carried on; respiration may go on perfectly and easily while the mouth is shut. If, then, this vapour be inspired by the mouth, double the quantity of air enters through the nostrils, precedes its entrance into the lungs, and shields the cells from its too powerful influence: hence a very small volume of chloroform is received into the circulation, just sufficient to lull sensation."*

* Op. cit. p. 31.

I am not aware of any physiological data existing, determining the relative amount of air passing through the nostrils when respiration is being chiefly carried on through the mouth; I should guess it at not more than a fifth. When, however, the patient gasps at the inhaler, as she will commonly do to obtain relief from pain, the nostrils should not be taken into account; the inhaler should be withdrawn, and she should be told that unless she inhale quietly, she cannot be permitted to have it. Were chloroform permitted under such circumstances, asthenia would be likely to ensue.

If the chloroform be withdrawn before the cerebro-spinal system is affected, the expression of the countenance will show it, by the well-marked expression of suffering, and by the *vigorous* cry for its continuance. Should its use not have been prolonged sufficiently, so as to lull the pain to its termination, or should it prove longer than the preceding one, I at once renew the chloroform, and it supplies the deficiency. This, however, if possible, should be avoided. When once relief has been given, by watching the countenance it can be easily determined if the pain be outliving the effects of the inhalation, and before the breath be held in bearing down, it can be renewed. This is a

matter entirely of practice, and the due administration can only be learnt from the book of nature, and not from written or verbal instructions.

When chloroform is used, I always at first administer it, during which time I show the party who will have to hold the inhaler, how it is used—*e.g.*, as withdrawing and returning the stopper, holding it properly, and not pressing it too forcibly on the face, or not holding it sufficiently close to it. When the uterine contractions increase, and the labour advances, I give up the inhaler to the nurse, or to a female friend—if there be one in the room—and then make her obey my directions. The expression of the countenance, the character of the voice, and feeling the pulse in the intervals of the pains, are sufficient criterions for one's guidance.

During the contractions of the uterus, I aid them as described at p. 53. This pressure is particularly useful when chloroform is administered, in increasing the contractile powers of the uterus, and in subsequently effecting a good contraction. When the inhaler is not applied, the party holding it should be told to put it down on the bed, with the valves downwards, so as to prevent its being heated by the hand, and the escape of the chloroform vapour. Care must

be taken to replenish the inhaler from time to time. The necessity for this is easily determined by putting the inhaler to one's mouth to ascertain if it be exhausted. A drachm should be used for each additional dose. It is especially necessary that the inhaler should be well charged during the last expulsive efforts, and the woman will then bear and require a larger dose of the chloroform.

During the time of the inhalation the room should be well ventilated, and the woman fanned in the intervals of the pains.

To recapitulate the following rules may be found useful :—

I. Always feel the pulse, and carefully examine the state of the patient immediately before the administration of chloroform. If the pulse be feeble and the woman excitable, or if hysteria exist, first give a diffusible stimulus—as a dose of *sp. ammoniæ comp.*—and then very cautiously and gradually administer the chloroform, commencing with not more than two or three short inhalations at a time.

II. Having rinsed the sponge of the inhaler nearly dry out of warm water, charge it at first with forty-five minims of chloroform. On first using it, it may excite slight spasm of the glottis ; if so, withdraw it for a moment, when it

will cease ; this must be repeated if it recur, as it may do, once or twice. Avoid the inhaler being heated by the hand, by having it held with the fore-finger and thumb only of the right hand applied to each side of the chamber, and so as not to interfere with the action of the valves.

III. Replenish the inhaler from time to time when the chloroform becomes exhausted—known by the accoucheur putting it to his mouth and trying it—with a drachm of it ; particularly during the last expulsive pains.

IV. Renew the inhalation when the chloroform is not accumulating, immediately the patient rouses up, and is aware of a pain coming on.

V. Do not let the patient gasp at the inhaler and inhale too rapidly ; if she persist in doing so, discontinue for a time the inhalation.

VI. When the pains are at the worst, shortly before delivery, the period of inhalation must be prolonged, but never to the extent of producing stertor, or loss of consciousness.

VII. Let the countenance and voice be your guides for the continuance of the inhalation. If the woman cry *vociferously*, and the features evince suffering, continue the inhalation a little longer. Commonly about four or six inspirations suffice.

VIII. Do not believe your patient's assertions of suffering, when made with a calm countenance, and bemoaning voice. Do not yield to the appeal *ad misericordiam*. Sometimes the effects of a previous inhalation—from the cumulative properties of chloroform—will suffice to lull a subsequent and short pain.

IX. Should the placid expression of countenance change to one of suffering when the inhaler has been withdrawn, at once re-apply it, and two or three additional inspirations will afford relief.

X. Feel the pulse attentively during the intervals of the pains. If it diminish in frequency and power, discontinue for a time the chloroform as it is accumulating, and wait until it returns to its normal state.

XI. Give some stimulant, from time to time, as may be judged admissible, especially if vertigo or weakness be complained of, even if the pulse do not alter in its character.

XII. Be careful to keep the room well ventilated, and have the patient fanned during the intervals of the inhalation.

By observing these rules, the inhalation may be continued with safety for several hours. Women who inhale chloroform, from escaping

the shock and exhaustion of labour, have usually the best recoveries.

Art thus—by position, by support, and by removing unnecessary distension—enables the muscular power to be most advantageously exercised; whilst by the judicious administration of chloroform, suffering is assuaged, and labour rendered more easy, by its diminishing the amount of resistance.

CHAPTER IV.

THE MANAGEMENT OF THE THIRD STAGE OF
LABOUR.

AFTER the birth of the child—the completion of the second stage of labour—the difficulties of natural labour commence. A gush of blood may accompany the expulsion of the child, and produce alarming symptoms of exhaustion, or hæmorrhage may precede, accompany, or succeed the expulsion of the placenta. More or less discharge always accompanies the escape of the placenta, and is often increased by the mismanagement of it. Hence it will be found convenient to treat post-partum hæmorrhage, and the management of the placenta together.

At this, the most critical time of parturition, the nurse commonly takes possession of the infant, and commences—if allowed—washing it; and thus, when the accoucheur most requires aid, it is not forthcoming. Securing the contraction of the uterus, to prevent hæmorrhage, and to effect the expulsion of the pla-

centa, engages the attention of the accoucheur during the third stage of labour. The contractions of the abdominal muscles, so useful in aiding the delivery of the child, are subsequently of equal value in giving support to the uterus, and aiding it in its contractions. The suffering and fatigue of labour produce a shock to the nervous system, and are followed by a corresponding amount of depression. This subsequent depression, as the author has before stated, *Med. Gaz.*, Jan. 16, 1846, and Nov. 14, 1851, is also probably aided by the sudden removal of pressure off the large bloodvessels, depending in its extent on the rapidity of the birth, its quickly succeeding the discharge of the liquor amnii, and the amount of that fluid. Some analogy appears to exist between this state, and that produced by paracentesis abdominis. The sudden escape of fluid by tapping, without the abdomen being "equally compressed," from "the quick removal of pressure of the water off the large bloodvessels, may produce swooning, convulsions, and sudden death." (Cooper's *Surg. Dict.*) Dewees also remarks, that "the suddenly emptying of the uterus by the evacuation of the waters, and the rapid delivery of the child, are the most common causes of the atonic state of the uterus." That the contraction

of the uterus, causing its large venous sinuses to empty themselves into the veins of the abdomen, enlarged by the removal of pressure, compensates in a degree cannot be doubted; and that in natural labour, and the patient being in the recumbent position, it is sufficient to prevent any dangerous depression. The amount of compensation must depend upon the amount of blood discharged with the throwing off of the placenta, the efficiency of the contractions of the uterus, and upon circumstances affecting it, and upon the support given by the abdominal parietes. This support from the abdominal muscles not only varies in degree according to their development, but also is diminished by the repeated distensions from former pregnancies; particularly, too, when means have been neglected of aiding them in recovering their tone after delivery. Their relaxed condition, accompanied with more or less diminished vigour in the woman, resulting from repeated child-bearing, accounts for post-partum hæmorrhage and after-pains being met with less frequently in primiparæ. Thus, two things favour the third stage of labour—viz., the gradual birth of the child, and the support—either natural or artificial—to the uterus and abdominal veins after its expulsion.

From the preceding remarks, deductions may legitimately be made which might be supposed would lead to a corresponding practice, and that difference of opinions and treatment would not be likely to exist. The reverse, however, is the case. Dr. Murphy's method of following down the contractions of the uterus with the left hand during the expulsion of the child, is most useful in aiding subsequent contraction of the uterus, and he directs when the child is born that "you should not withdraw your hand from the uterus until you have secured it, either by a temporary bandage (afterwards described) or by the hand of the nurse if she is sufficiently intelligent to understand your object. The latter plan is more convenient."* Dr. Churchill directs thus—"The left hand must be employed in supporting the perinæum as the shoulders press forward. When the head is expelled, the nurse should be directed to make gentle steady pressure upon the uterus, and to follow it down, keeping her hand firmly upon it until the binder is applied; by so doing, we shall rarely have any trouble or delay with the after-birth."† It is generally admitted, that any hastening of the expulsion of the child when the head is born, is injudicious, and likely to excite irregular

* Op. cit. p. 97.

† Op. cit. p. 181.

contraction of the uterus, and thus to lead to troublesome retention of the placenta. Some judgment is required in pressing on the uterus during the birth of the child: it should follow not precede the uterine contraction, and should not be continued during the absence of a pain. Consequently, a nurse is ill-suited to give this support, and she may hasten the contractions by injudicious and continued pressure. I prefer being independent of the nurse—for she cannot be relied on—by using my uterine compress represented in the following wood-cuts, and which will again be referred to in treating on the management of post-partum hæmorrhage.

Fig. 1.

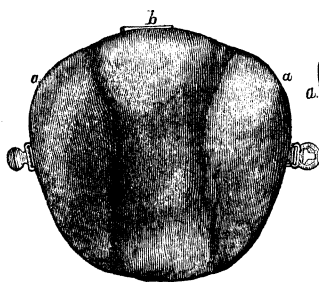


Fig. 2.

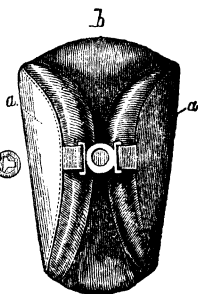


Fig. 1. The compress consisting of three pads united, with the concave surface—which is

applied to the abdomen—in view; *a b a*, the upper border; *b*, central pad; *a a*, lateral pads.

Fig. 2. The compress folded up for convenience of carriage; *b*, central pad and upper border; *a*, lateral pad; measuring $7\frac{1}{2}$ inches long by $4\frac{1}{2}$ broad.

Fig. 3.

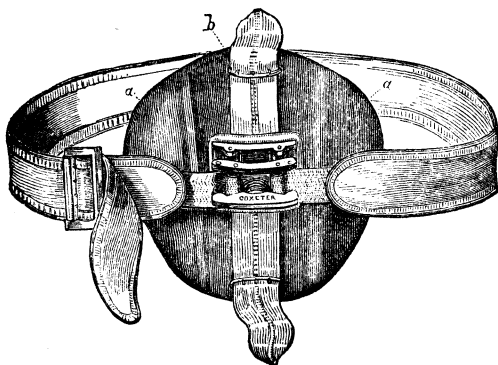


Fig. 3. The compress as applied; *b*, upper border; *a a*, the belt of webbing having a tourniquet attached to it, and which is fastened to the compress by two short straps and buckles. The buckle on the side of the cut connects the two ends of the belt, and when fastened tightly, is further tightened by the tourniquet-screw. The convex surface of the compress measures 9 inches transversely by $7\frac{1}{2}$ long. The pads

are connected by double-stop hinges, which prevent their yielding backwards.*

The author first brought this compress before the attention of the profession in the *Medical Gazette*, January 16th, 1846. Subsequently, Dr. Murphy honoured him with a notice of it in his "Lectures on Parturition," p. 360. It consists of three pads, the central one being the largest; the lateral pads are narrower, and the whole when open form a concave pad, that presses equally on the uterus, at the same time it does not allow of its escaping laterally or upwards, as the central pad is thicker at its upper border, and the lateral pads are thicker at their upper and outer edges. The belt is of webbing about four inches wide, and its ends are fastened by a buckle. It has attached to it Mr. Coxeter's improved tourniquet, the screw of which is only half the length of the one on the old principle—for the convenience of carriage—but by additional rollers it raises as much web; the belt and compress being separate, are easily carried. "The object of this bandage is to maintain pressure on the uterus laterally as well as above the fundus, and to increase or diminish the pressure by means of

* The uterine compress is made by Coxeter, of Grafton-street, and costs 30s.

the tourniquet; thus, you may cautiously relax the pressure, or again increase it to any extent, without disturbing the abdominal bandage, which in this case need not be so tightly applied as when you have no additional means of increasing the compressing force.”* The belt is most conveniently passed under the patient just before delivery, it is then ready for attachment, or it can be passed immediately afterwards under her. The pad can be instantly and easily adjusted, and a more or less powerful and steady pressure over the uterus is obtained, which can be regulated by the tourniquet screw, and which prevents relaxation of it and hæmorrhage, and aids in the expulsion of the placenta.

The cord can then be divided, care being taken to do so transversely and not obliquely, and too near the ligature. I at first prefer using the compress without the bandage, as it is more quickly applied, and the latter is sure to get soiled, and to require soon changing if applied before the woman is made “clean and comfortable.” If the compress be not employed, the bandage ought to be used immediately after the removal of the child. It is the exception to the rule for it to be properly put on: as ordinarily applied, it gives but little support, and soon rucks up

* Murphy, p. 360.

and becomes displaced—often it will be found to have almost rucked up to the waist. This may be one cause of its often being disregarded, or objected to. It cannot be rolled around the abdomen as an ordinary bandage is applied, for the parts it traverses are irregular and of unequal size, and of course twisting it is out of the question.

The most suitable material for the bandage is ordinary calico, not too fine. A yard and a half should be procured, which will suffice for two bandages, when torn equally in two along its length. One half should then be taken, and a piece about five inches wide should be torn off one end of it. The remainder of it should then be folded twice equally, so as it were to divide the piece of calico into three equal parts. The selvage border being towards you, let the strip of cloth previously torn off, be strongly stitched to it at the junction of the left and middle thirds. The right and middle thirds can then be loosely rolled, and the bandage is ready for use. It is an advantage having a “raw edge” to the upper border of the bandage, as it allows of its yielding to the figure; whereas the lower border having the selvage edge will not yield, and this is just what is required of it. If flannel be not too warm, or uncomfortable to

the woman, it may be used instead of calico; its greater elasticity is an advantage that it possesses.

In applying it, it must be next the skin, and should be passed underneath the woman from the left side by the nurse, who should be told to get it sufficiently low down, as it should reach just below the trochanters. Care must be taken that the slip of cloth, which ought previously also to be rolled up, correspond to the coccyx. The bandage is then to be unrolled and drawn over from left to right, without in any way exposing the woman; and the two ends meeting on the right side should be tightened inferiorly as much as possible with the forefinger and thumb of each hand, and should then be held firmly with the left hand, and having ascertained that the skin is not pinched up with the bandage, it should be securely pinned. Ordinary pins are of no use, as they are not sufficiently strong. Short drugget-pins, or, still better, Rowley's nursery pins—whose points are protected, and cannot prick the woman—are suitable. Five pins suffice, placed at equal distances. The bandage should be tightly pinned up to a line with the umbilicus; above this point, it may be a little looser, so as not to interfere with thoracic respiration. Two pins

beyond this part will be required ; the umbilicus corresponding with the third pin, and having two below it. The bandage reaches the ensiform cartilage, and this is necessary to prevent any bulging upwards of the abdominal parietes. The bandage thus applied, and being pinned to the figure, should be without a crease, and will afford an equable and grateful support. Afterwards, the slip of calico can be brought forward from behind by the nurse, and with a napkin intervening, can be pinned to the lower border of the bandage in front. It will thus be securely kept in its place, and cannot ruck up. The bandage being tightly pinned below the trochanters, does not always effect this, and from its interfering with the movements of the patient, and being somewhat in the way when it is necessary for her to relieve herself, the bottom pin is either generally removed, or the bandage here is loosened, and as a matter of course becomes displaced. It is not necessary to pin it quite so low when the slip of cloth is used to keep it in position. In corpulent women the bandage should be applied before the compress, as the latter fails sufficiently to embrace the abdominal parietes, although it presses on the uterus. The application of the bandage is commonly left to the nurse, who is

ignorant in the matter; consequently its use is attended with little or no benefit, and only causes inconvenience. It should be daily attended to by the accoucheur so long as his patient lies in bed. Afterwards a bandage, cut to fit the back, and fastened with tapes in front, can be substituted for the former one, which can be easily attended to by the patient herself. It is injudicious to give up the use of the bandage when the stays are worn, as the latter are no substitute for the former, and in fact render a bandage more necessary. The stays press down the abdomen, and would aid in making it pendulous; whereas the bandage supports the abdomen, and helps in restoring it to its normal size. However, the two may be used together, and the bandage will be found useful for a month or longer after delivery.

The cases that most require the support of the bandage are met with in women of a lax habit, who have borne several children, and whose abdomen is pendulous or flabby. If it be believed that the abdominal parietes should give support after delivery, it is difficult to imagine why the bandage should be objected to. By using it, we are consistently carrying out the practice of giving support, by following down

the contractions of the uterus during delivery. It has been shown that the abdominal muscles aid the contractions of the uterus when well developed during labour: why not afterwards? Their restricted development has also been alluded to; hence the reason of adopting artificial aid. With a generally relaxed state of system, too, the sudden removal of pressure is more likely to influence, consequently the prevention of this—as in paracentesis abdominis—would indirectly by means of the bandage aid in effecting the contraction of the uterus, whilst its immediate support would directly assist in promoting and retaining it. Again, what helps in securing the contractions of the uterus, does so in averting hæmorrhage. Also what aids in averting hæmorrhage, does so also in preventing after-pains from clots. Those too arising from flatus are less likely to occur when the intestines receive due support. The bandage is correctly regarded as a great means of restoring the abdomen to its usual size; and although not so much needed in primiparous women, yet it does them good service in future pregnancies and deliveries, by preserving the shape of the abdomen, enabling its walls to recover their normal condition after repeated distension, thus averting

the child lying too forward in a subsequent pregnancy, and preventing a frequent source of prolongation of labour.

As before stated by me,* the only disadvantage attending its use that I am aware of, arises from its not being properly applied, by being fastened too tightly above the umbilicus, and consequently interfering with the respiratory movements of the thorax. When after-pains have continued some time from inefficient contraction of the uterus, and efforts to expel clots, and which the bandage has failed to relieve in four or five hours, its removal and fomentations and an enema have been advised. The charges made against it by Mr. Kesteven,† of aggravating after-pains, inducing irregular contraction of the uterus, displacing the uterus and causing obliquity, prolapsus, &c., the last of which is also attributed to it by Mr. Reeves,‡ who considers it should be condemned, like stays, by sensible persons, as interfering with the natural powers, cannot be admitted. I believe that it frequently effects *too little*, and that when after-pains have not been prevented by it, that the pressure has not been sufficient, as in cases not

* Med. Gaz. Nov. 14, 1851, p. 843.

† Ibid. Sept. 12, 1851, p. 462.

‡ Lancet, July 21, 1855, p. 61.

only with weak abdominal walls, but also with deficient *vis nervosa*, and a relaxed state of the uterus. In such cases the bandage may be found unequal to preserve contraction of the uterus, and relaxation and hæmorrhage may ensue. Its inability, *per se*, to produce contraction of the uterus and to arrest hæmorrhage is certain. Dr. Collins, of Dublin, thus advises it to be used with a contracted uterus; and although the late Dr. Davis only used it in cases of flooding, it would in the hands of many accoucheurs be found in the way, from its interfering with the adoption of other treatment. The bandage is used more for prevention than cure, and when applied with a partially-contracted uterus, if there be no external hæmorrhage, a certain amount of internal may occur, clots form, and pains succeed from the efforts to expel them. In cases of external hæmorrhage, consequently, means of applying a greater amount of pressure have been resorted to by the late Dr. Davis and others—as by books, pads, basins, &c. The fact that after-pains are not usually met with in primiparous women, and also that post-partum hæmorrhage is less frequent in these cases, certainly is in favour of the use of the bandage, for under these circumstances the abdominal parietes have not been weakened by repeated

distension, nor the strength diminished by previous child-bearing and nursing. After-pains of a neuralgic or nervous character we cannot expect to be relieved by it. Those proceeding from the attempts to expel clots we cannot depend upon being prevented or removed by it, but in those arising from flatus it is of great service in preventing and relieving. The value of the bandage depends greatly upon its proper and immediate application after the birth of the child.

Mr. Kesteven remarks that "for the prevention of hæmorrhage, the application of a roller certainly possesses no claim." It has been previously stated that it is insufficient to *arrest* it; but what aids in securing the contraction of the uterus, must aid too in preventing hæmorrhage, and he admits "where pressure is properly made, hæmorrhage is not frequently met with." Mr. Kesteven further states concerning the application of the bandage, that "the indication for its use in reference to the prevention of syncope is theoretically deduced by analogy from the necessity that exists for the application of abdominal compression during the operation of paracentesis abdominis." I believe that I first pointed out this in the *Med. Gaz.* January 16, 1846. He writes: "Here, although an

analogy does undoubtedly exist, the cases are far from parallel, the conditions not identical, at least not in labour unattended with flooding. When hæmorrhage from the uterus occurs, the heart is then physiologically affected in the same manner as where a large quantity of dropsical effusion has suddenly been removed from the abdomen. The removal of the pressure from surrounding vessels in the one case being performed in the upright or sitting posture, suddenly empties the heart of its blood, in the same way that it is emptied by a sudden gush from the uterus. In natural labour there are these points of physiological difference: the heart is not suddenly deprived of a quantity of blood, because the mass of blood previously circulating in the enlarged vessels and hypertrophied structure of the uterus is thrown back upon the aorta(?) *pari passu* with the diminution of the tumour by the contractions of the uterus. The consequent removal of pressure from the surrounding vessels is therefore compensated by the non-abstraction of blood from the arterial system, which, so far, may be regarded as the equivalent of the compression which is had recourse to for the purpose of obviating the sudden change in the state of the circulation that takes place in tapping. Cases of excessive quantity

of liquor amnii, triplet and quartet cases, form instances in which the analogy with the effect of tapping becomes closer. The difference in position must also be borne in mind, when an analogy is attempted to be drawn between these two conditions. In tapping, the position is erect; in labour, it is horizontal." A fallacy here exists in attributing in the first instance the syncope, or tendency to it in labour to hæmorrhage, instead of the hæmorrhage to the threatened syncope. Dewees writes: "The suddenly emptying of the uterus by the evacuation of the waters, and the rapid delivery of the child, are the most common *causes* of the atonic state of the uterus." It by no means follows that "a sudden gush from the uterus" acts directly upon the heart in suddenly emptying it; for, as I have before written, when there has been one gush and that not renewed, provided the uterus contracts with it, the woman does not feel this loss as she would a much smaller quantity under different circumstances—as from venesection; for, as Denman states, "Should every drop of blood which circulates in the uterus be discharged in an instant, it would be of no immediate consequence to the patient, the very existence of the uterus not being necessary for life;" but if this were not followed

by permanent contraction, danger must ensue from the demand made upon the system. The danger in both cases is similar, differing in degree. It is further argued, that when hæmorrhage occurs the analogy holds good; but otherwise that "the mass of blood previously circulating in the enlarged vessels and hypertrophied structure of the uterus is thrown back upon the aorta (?) *pari passu* with the diminution of the tumour by the contractions of the uterus." That the contraction of the uterus, causing its large venous sinuses to empty themselves into the veins of the abdomen enlarged by the removal of pressure, compensates in a degree cannot be doubted; and that in natural labour, and the patient being in the recumbent position, it is sufficient to remove any dangerous depression. "The current of the uterine circulation is altered, both in its direction and force. The arterial blood is no longer drawn towards the cavernous structure in the placenta, but flows into the intercommunicating branches in the parietes of the uterus. The current of the venous blood is directed much more rapidly towards the great central trunks of the abdomen, because these vessels are now relieved from the pressure of the gravid uterus, and, by their expansion, the venous blood is drawn more

strongly from the terminal branches towards the central canals.”* The amount of compensation must, as before stated, depend upon the amount of blood discharged with the throwing off of the placenta, the efficiency of the contractions of the uterus, and upon circumstances affecting it, and upon the support given by the abdominal parietes. The abdomen being “equally compressed” by the bandage, must aid in diminishing the effects resulting from the removal of “the pressure of the gravid uterus.” Although I have not seen syncope occurring immediately after delivery without hæmorrhage, yet I have witnessed so much sudden exhaustion with the woman in the recumbent position, as to render some exertion necessary to prevent its occurrence. I have found by experiment in a few cases, that the sudden removal of considerable pressure previously produced by my uterine compress after delivery, has caused such a sensation of faintness that I have been glad to tighten the compress by means of the tourniquet. The analogy does still hold good between the effects arising from paracentesis abdominis without support and rapid delivery, although modified by the contraction of the uterus expelling its venous blood into the abdominal veins, and

* Murphy, *op. cit.* p. 306.

the position of the patient; and depression will be met with after delivery without hæmorrhage necessarily occurring, and which is attributable in a great degree to the removal of the pressure of the gravid uterus.

The charge against the bandage of producing prolapsus is difficult to comprehend. What aids in preserving contraction of the uterus, aids too in its more quickly diminishing in size. Prolapsus, too, commonly, is attributable to sitting up too soon after delivery, and sometimes I believe to too hasty and violent withdrawal of the placenta when retained *in utero*. General debility is a predisposing cause, and as Dr. E. Sheppard has remarked, "too early marriages, excessive copulation, and the drudgery of daily life in squalid homes,"* favour its occurrence. Dr. Ramsbotham remarks: "There is no affection of the uterus more common, especially among the *poorer* class, than this; and no means should be neglected which can prevent so serious a calamity."† And yet the poor are referred to as proving the needlessness of bandaging. Mr. Kesteven states that, in the vast majority of cases, the uterus contracts rapidly, firmly, and permanently, directly upon delivery,

* Lancet, July 28, 1855, p. 91.

† Obstetric Med. and Surg. p. 515.

without the aid of bandaging. That such is the case, a very short experience among the *labouring poor* will soon convince the clinical student. The poor women who are delivered by midwives, and the hundreds, aye thousands, who are yearly delivered without any aid, would, were it not so, have all the dangers of uncontracted uterus to contend with. That such is rarely the case, admits of no doubt. Mr. Robertson observes, that “uterine hæmorrhage is unfrequent among the poor.”* Were the bandage a chief cause of prolapsus, it should not be met with among the poor, in whom bandaging is usually neglected.

Possibly cases now more frequently occur requiring the use of the bandage than formerly. Tight lacing and sedentary habits greatly enervate the system, affect the development and strength of the abdominal muscles, and are a fruitful source of post-partum hæmorrhage. Mr. Robertson’s remark that uterine hæmorrhage is unfrequent among the poor, is not, as would at first appear, an argument against the utility of the bandage in ordinary midwifery practice, because it is not commonly used among this class; it only shows that women who work hard can ordinarily do without it. Were all women

* Med. Gaz. Sept. 12, 1851, p. 460.

accustomed to the active exertions of the poor, and were to experience what hard work is, the well known law that muscular exertion is accompanied by muscular growth would be exemplified, enervation would subside, tight lacing would be discontinued, the muscular parietes would be well developed, the uterus would possess its proper contractile power, and it and the contents of the abdomen would receive their due support, and thus the main causes of hæmorrhage would cease.

Still with this *quæstio vexata* nothing but disagreement exists. Some writers do not mention its use in natural labour, as Dr. Merri-man. Dr. Denman writes—"Some years ago, it was a general custom to bind the abdomen very tight immediately after delivery, with the view of aiding the contractions of *the integuments*, and of preserving the shape of the patient. In some countries, India in particular, this was practised to a degree, that one cannot think of without shuddering at the mischief which must of necessity have been very often occasioned. In this country the practice has been very much discountenanced as useless and pernicious, and it is now wholly or nearly laid aside except in particular cases, till *five or six days after delivery*; when a broad band, daily but very gradually,

drawn a little tighter, may be applied not only without injury, but with some advantage." The improving of the figure? He then continues—"One of the first, and not an *uncommon* consequence of delivery, is *faintness*. This may proceed from any of these causes, loss of blood, fatigue of the labour, *sudden emptying of the abdomen* and its consequent changes ;"* and yet the support of the bandage is "discountenanced as useless and pernicious." Dr. Ramsbotham writes—"The principal object which the bandage serves is to bind the bowels, and give an artificial support in lieu of that which they have lost through the laxity of the abdominal muscles ; and to prevent the faintness frequently attendant on the sudden removal of a certain degree of pressure. It may to some extent, indeed, stimulate the uterus to more perfect contraction ; but if that organ be unnaturally flaccid, it would be wrong to rely on compression by a bandage, to insure its more powerful action, or prevent its cavity becoming distended with blood ; in such a case, the only safe means of exerting sufficient external pressure is by the grasp of the hand, steadily and for some time unremittingly applied."† The late Dr. Davis wrote—"But for the last fifteen or twenty years he has

* Vol. ii. p. 450.

† Op. cit. p. 151.

very rarely had recourse to it, except in cases of threatened hæmorrhage, in the treatment of which its use is often of indispensable importance.”* Both Drs. Rigby† and Ramsbotham advise it to be applied when the body-linen of the patient is changed. Drs. Lee and Murphy recommend it to be applied immediately after the birth of the child, and additional pressure to be used in cases of hæmorrhage. Dr. Churchill considers it “very useful at first in maintaining a certain degree of contraction of the uterus, and giving support to the abdomen, and afterwards in promoting a return to the natural condition of the uterine and abdominal parietes; for which reason he thinks it deserving of more attention than is usually paid to it, at least *after the first day or two*. He believes that if it be duly applied during the time the patient keeps her bed, she will avoid that loose state of the integuments which gives rise to what is called pendulous belly.”‡ Dr. Merriman recommends it: “Should the placenta be expelled, and the hæmorrhage be inordinate, in addition to the usual means of subduing it, pressure must be made upon the uterine region, by means of the hands or a broad bandage put round the body.” Dr. Blundell advises it to be used

* Obstetric Med. p. 639.

† Page 117.

‡ Page 182.

external to the dress of the patient. Dr. Burns recommends pressure over the uterus with the expanded hand until the placenta is expelled. Afterwards, "A broad bandage is to be slipped under her, which is to be spread evenly, and pinned so tightly round the abdomen as to give a feeling of agreeable support. This bandage is made of linen or cotton cloth; and it is usual to place a compress over the uterus, to assist contraction. In some, if not in many cases, this might be dispensed with, as we see in a state of nature; but in civilized life, it is useful if not absolutely necessary. For the abdominal muscles do not contract, so as to afford a support to the parts within, and syncope, breathlessness, or other unpleasant effects, may be the consequences." He further directs that the accoucheur, before he leaves, ascertain "that the bandage be felt agreeably tight." And in cases of flooding, he states that "it is of consequence to have the whole belly firmly supported with a bandage, if this can be applied without moving the patient much."* Mr. Roberton, who prefers at first commanding the uterus by the hand, and "gently grasping the fundus uteri, taking care that it is evenly embraced by the hand; that is to say, that the

* Principles of Midwifery, pp. 500 and 512.

friction or gentle grasping is applied to *the fundus and not in front*,"* also remarks that "the uterus being now partially emptied, no longer fills the abdomen, and consequently has ceased to receive support from its relaxed parietes; therefore when the patient lies on her side, the uterus falls downwards and forwards, inclining from the line of axis; but when she is on her back it rests on the viscera, and is more readily supported and manipulated."† Here the position and finishing the delivery on the back, are the proposed means for attempting to relieve what the bandage accomplishes conveniently under such circumstances. Afterwards, when satisfied of the state of the uterus, he puts on an "abdominal compress and bandage."

To sum up, depression varying in extent is found to occur after delivery, dependent partly upon the fatigue and suffering from the labour, and partly upon the removal of the pressure of the gravid uterus. The causes of it vary in degree, the former according to the severity and duration of the labour, the latter according to the rapidity of the labour, the quantity of liquor amnii, the size of the child, the strength of the abdominal muscles, the general tonicity of the system, and the amount of blood lost in the separation of

* Page 356.

† Page 355.

the placenta. The object of the bandage is to afford the support that well developed abdominal muscles should yield, and in preventing the depression consequent upon the removal of pressure off the large bloodvessels; hence the necessity of it, or an equivalent for it—as the compress — being applied immediately after the birth of the child. It then indirectly aids in averting hæmorrhage by preventing the depression, and directly by its support, aids in retaining the uterus in a contracted state. It is, however, insufficient for exciting contraction of the uterus, nor can it be depended upon for retaining the uterus in a contracted state, although it may be so applied as to yield more support than the abdominal parietes would naturally give. And this is not to be wondered at, for too commonly a relaxed state of the abdominal muscles is accompanied with more or less general relaxation of the system: the bandage compensates for the former, but not for the latter, and thus the uterus may relax, and hæmorrhage ensue. It can then only be considered an aid—yet still a most important one. Were it to be fastened tighter at the upper part than the lower, it might perhaps be imagined that the uterus would be forced downwards, the reverse, however, is the case. As prolapsus

is found to occur more among those who are not bandaged—as the poor—the omission of it would rather tell against those who attribute it to the bandage—and with reason too: for the more contracted the uterus is after delivery, the less heavy it would be, and less bearing down likely to be felt. In truth many circumstances predispose to this malady, as severe labour—especially if instrumental, undue force in the removal of the placenta, getting up and about too soon after delivery, frequent child-bearing, general debility, a wide pelvis, hard work, lifting heavy weights, and the like.

Having then supported the abdomen, an examination must be made, using the cord as a guide, and holding it with the left hand, whilst the fingers of the right are passed into the vagina. The object of it, is to ascertain that there is not a second child, and the position of the placenta, “on the proper management of which the life of the patient may depend.”* It is at this stage of labour, that the difficulties of it so often commence. The young accoucheur, having studied carefully the mechanism of labour, the positions of the head, &c., is commonly quite unprepared for the troubles he may have to contend with. He may be unable to

* Denman, vol. i. p. 375.

remove the placenta, clots may form in the vagina and perplex him, or hæmorrhage either with or without retention of the placenta may alarm him. The prolongation of the termination of the second stage of labour, favours the placenta being thrown off, whilst any undue hastening of delivery by drawing away the child, instead of allowing the uterus to expel it, will probably be followed by irregular contraction of the uterus, troublesome retention of the placenta, and perhaps hæmorrhage.

Occasionally the placenta is expelled with the child, not unfrequently it will be found in the vagina. Coagula found in the vagina may, at first, embarrass the accoucheur; they can easily be distinguished by their soft, smooth surface, and by their easily breaking under the finger, and should be removed. Usually, from the great distension the vagina has undergone, it will not expel the placenta sufficiently soon, and has to be removed. Commonly, the uterus rests for a few minutes after the expulsion of the child, after which slight pains return. If, then, the insertion of the cord can be distinctly felt, and the fingers can be passed round the placenta, it may be considered wholly in the vagina, and its removal can be effected. If no pain occur at the end of twenty minutes or so, it

may be withdrawn: it is better to wait this time to avoid hæmorrhage, or exciting irregular contraction of the uterus. The axes of the pelvis should be borne in mind when using traction, so as to accomplish the extraction of it as easily as possible. When the placenta is in the upper part of the vagina, the cord may be twisted round two or three fingers of the left hand, and drawn gently and steadily towards the coccyx, one or two fingers of the right hand being used to hook it downwards: when it has descended, the fingers of the right hand being withdrawn can hold the cord, drawing it forwards and downwards in the axis of the outlet, whilst the left hand can receive the placenta. Care should be taken to remove the whole of the membranes, as a portion is sometimes within the uterus, and held by it when the placenta is expelled. If it be found that with gentle traction they do not yield, two fingers of the right hand should be passed well up into the vagina, and holding the membranes between them they should be drawn carefully downwards and backwards so as not to tear them, and leave part behind; for, were such to occur, they might undergo decomposition. Afterwards, any clots in the vagina should be scooped out with the fingers, and the bandage or compress tightened.

Denman states, that "for many years he made it a rule to leave the placenta, naturally or artificially separated, to abide in the vagina one hour after it was voided out of the cavity of the uterus; as he was convinced by this method that there is an infinitely less chance of an ensuing hæmorrhage on its coming or being brought away, and less after-pain. For the blood discharged in consequence of the separation of the placenta usually forms into coagula, which are collected into the membranes as in a net, and the uterus is left perfectly void of anything which can become the cause of any considerable pain."* The placenta being retained in the vagina can only act as a plug, and plugging is admitted to be quite ineffectual in arresting post-partum hæmorrhage, as the uterus can dilate, and an internal hæmorrhage be exchanged for an external one. Moreover, the retention of a large coagulum would act like a retained placenta, the uterus would be more or less distended, it would resume its action, increased hæmorrhage might occur, and, if the accoucheur have not been on the alert, the first indications of this happening might be sudden symptoms of syncope. If internal hæmorrhage of a severe character be escaped, after-pains from the efforts to

* Vol. ii. p. 337.

expel coagula would most probably follow. If the uterus be contracted, and the vagina free, blood will not be retained, and the exact amount of discharge can be ascertained.

The placenta may be partly in the vagina and partly within the uterus, in which it may or may not be retained by irregular contraction of the cervix. When this is the case, the substance of the placenta can be easily discovered, either in front or behind the cord, but the fingers cannot pass all around it as when in the vagina. The endeavour here should be to excite the uterus to action by pressure, and during the existence of a pain to make the woman bear down a little, whilst gentle traction downwards and backwards—in the axis of the brim—is employed. It must, however, not be forgotten, that occasionally a partial adhesion exists, and any undue force might cause a laceration of the placenta; and a portion being left behind, might cause a continued exhausting drain, or, as when the secundines are retained and become decomposed, phlegmasia dolens might result. If no pain ensue in fifteen or twenty minutes after delivery, the following draught may be given to induce it, and to remove any irregular contraction of the uterus, should it exist:—

R Tinct. secale corn. ℥j
 Sp. ammoniæ comp. ℥ss
 Tinct. opii. ℥ xx
 Aquæ ℥iss. M. et fiat haustus.

This and pressure on the uterus will excite it to action should no adhesion occur; if, however, the placenta be not discharged at the end of an hour, it would then be justifiable to introduce the hand—the left is the better one, as it accommodates itself more easily to the curve of the sacrum—which should pass above the placenta, so as to embrace the whole of it, when any adhesion can be broken through, and the presence of the hand will excite a contraction to expel both it and the placenta together. This will be more fully adverted to presently, when treating of adherent placenta. The introduction of the hand will rarely be necessary, and it “ought never, on any account, to be introduced in the uterus except as a matter of necessity, and then with the utmost care and tenderness; and when introduced, should never be withdrawn till the end for which it was introduced is, if possible, accomplished.”*

The placenta is retained within the uterus from “torpor” (Burns), or “suspended action” (Murphy), of it; from inertia, from irregular

* Denman, vol. ii. p. 331.

contraction, and from morbid adhesion. It is known to be in the uterus when the insertion of the cord cannot be felt ; or, if so, only it, and not the mass of the placenta at the same time.

When it is retained merely from want of action of the uterus to expel it, it is easily removed. A period of rest is usual, the duration of which may, however, continue too long, as the result of want of support to the uterus during the expulsion of the child, and afterwards from weak abdominal walls, and the neglect of the bandage, or the inefficient application of it. The depression, too, that more or less succeeds the birth of the child, favours this deficient action. So long as the placenta is retained, is hæmorrhage likely to occur. Hence the accoucheur ought not to leave the bed-room until it is expelled, or his patient until he has ascertained that hæmorrhage is not likely to ensue. The undue hastening, too, of the expulsion of the placenta may induce hæmorrhage. Denman mentions, after a certain time not less than one, "perhaps two, or even more hours after the birth of the child, unless we are compelled by hæmorrhage or some untoward symptom, gentle means are to be used to favour its exclusion."* He also states, that "both the child and pla-

* Vol. ii. p. 330.

centa are equally passive substances, expelled by the action of the uterus; and the latter, like a dead child, may without prejudice remain in the uterus many hours, or even days, without doing any mischief.”* Burns’ rule is more rational, and the best: “If it be not excluded within an hour after delivery, we ought cautiously to extract it.”† Denman’s comparison is a false one; for when the placenta is retained after being thrown off, and the membranes are separated from the surface of the uterus, hæmorrhage may occur. From want of proper aid, however, the uterus may contract around the placenta, and no evil result, although retention may have occurred for many hours. I once was called to a case, where traction had unsuccessfully been employed, and the placenta had been retained for eight or ten hours. The uterus had contracted around the placenta. By merely pressing on the fundus uteri with both hands, the placenta was instantly expelled, and shot into the bed with some force.

If, then, no pain ensue in about fifteen minutes after the expulsion of the child, the ergot draught, as before mentioned, should be given, and pressure should be employed, either by the hand, or compress, to excite the action of the

* Vol. ii. p. 339.

† Page 370.

uterus. Forcible pulling of the funis may tear it off, or it may excite irregular contraction of the uterus, and perhaps hæmorrhage, too ; or if the placenta be adherent, it may produce inversion of the uterus ; or it may detach it more without doing it entirely ; or it may tear it, causing a portion to be left behind, which, by irritating the uterus, and by the attempts of the latter to expel it, may excite a dangerous hæmorrhage ; or it may undergo decomposition, and produce an irritative low form of fever, or uterine phlebitis.

Atony of the uterus is not a frequent cause of retention of the placenta, except when succeeding to a state of "torpor," or "suspended action" of it. It more commonly is the result of hæmorrhage, sometimes arising from deficient support to the uterus during and after the birth of the child ; or it may precede flooding with women of weak constitutions, and who have been exhausted by severe and long-continued labour. Before the expulsion of the child, the pains will be observed weak ; sometimes they are unequal to effect it, and instrumental aid becomes necessary ; in short, it occurs when "the uterus has become worn out, and the powers of life are much depressed."*

* Ramsbotham, p. 409.

Dr. Ramsbotham states, that “we may presume that atony is the cause, if after the birth of the child the uterus remains soft, large, and flabby; if there be no after-pains; if, when we take hold of the funis—and this is a good indication—we find that the vein is not full, that it is quite flaccid; because, if the placental mass be squeezed by the uterus contracting upon it, the blood will be forced down from the placenta into the cord, under which action the arteries and vein become turgid and distended: and we may frequently observe it twist in a trifling degree, or writhe spontaneously, somewhat like an eel, as often as a fresh contraction occurs in the uterine parietes.”* The depression resulting from the removal of the pressure of the gravid uterus probably helps its occurrence, especially when it has been increased by hæmorrhage, to which it has given rise. Dr. Murphy remarks, that you may recognise true inertia “before any hæmorrhage takes place, even when the child is being expelled. The fundus of the uterus has not its usual firm feel under the hand; it seems spongy or like dough, and is larger than it ought to be, because it very seldom contracts to its full extent. After the delivery of the child, when the uterus generally remains contracted,

* Ramsbotham, p. 409.

it will not do so. You may have followed the contracting uterus with the hand, moderately compressing it; and in a short time you find that it has eluded your grasp, and cannot be felt. Strong frictions over the lower part of the abdomen may again excite its action: but it is only for a moment—again it is lost. While this want of tone may be observed in the uterus, a corresponding amount of constitutional irritation may be noticed in the patient. The pulse is increased in frequency, and assumes the jerking hæmorrhagic character; the patient is watchful and restless; complains of sinking, and does not experience that relief from the termination of her sufferings that is usual after delivery. All these symptoms may precede any hæmorrhage, and should be most carefully watched: they are the monitors of what is approaching.”* They, too, more commonly succeed a certain amount of hæmorrhage that precedes or succeeds the exclusion of the placenta, and which efficient aid may relieve; whereas supineness, or improper treatment will probably be followed by inertia that might have been prevented; so that—as previously stated—inertia or atony of the uterus is more commonly the result of deficient activity of it, after the

* Op. cit. page 356.

birth of the child, and is most usually met with in women enfeebled by repeated child-bearing, with weak abdominal parietes—weakened, too, by previous distension. Thus, then, with more or less deficient *vis nervosa*, a want of power or tone in the uterus, is made worse from the absence of the due support of the abdominal parietes, which indirectly affects the uterus from its effects on the circulation, and directly from the pressure they ought to yield on the uterus and intestines. It is in such a case, then, that mismanagement may be productive of serious, or fatal results.

As, then, atony more commonly succeeds to a state of “suspended action” of the uterus, and which has given rise to hæmorrhage, to be followed by more or less symptoms of exhaustion and uterine inertia, our object should be to effect good contraction of the uterus by pressure on the fundus, and following down its contraction during the expulsion of the child; not hastening it by drawing the child away, but allowing the uterus to expel it, and by giving support by the application of the compress, or bandage, or both, as may be deemed advisable.

Atony of the uterus dependent upon general debility and protracted labour, we should endeavour to avert by not allowing the labour to con-

tinue until it produce exhaustion, and by resorting sufficiently soon to instrumental aid if actually necessary. On the other hand, we must not anticipate the symptoms of exhaustion, but only act when they are about to set in. We should support the strength of the patient during labour, and although stimulating drinks are ordinarily forbidden, wine and water in small and frequent quantities will be found most useful. Supporting the uterus, as recommended by me, page 47, during each pain, will greatly aid. Drs. Merriman and Lee advise the application of a bandage. If the head have become moulded and is descending on the perinæum, uterine action may be increased by a dose of ergot of rye combined with the *Sp. ammoniæ comp.* to prevent any depressing action of it on the heart, and to stimulate as well. When exhaustion threatens, the pains become more feeble and less frequent, the pulse quick and weak, the countenance anxious and worn; sleep is absent, and the woman is restless and excitable. If sleep can be procured, the system is renovated, and the uterus returns with increased vigour to its duties. To procure it, twenty or thirty minims of *Tinct. opii* with half a drachm of *Sp. ammoniæ comp.* should be given. More frequently a woman becomes exhausted by false

pains and cramps; they are most commonly met with in weak excitable women, and are dependent upon some nervous irritation. On examination per vaginam, the pains will be found not to tell. The uterus may act, but it contracts irregularly—often a state of hysteria exists. I recently saw a case in which the woman had had pains for nearly five days; they were too severe to allow of any sleep, labour had made no progress, and she was rapidly becoming exhausted. I gave half a drachm of Tinct. opii at once; the pains soon ceased; she slept well the same night, and about the middle of the following day true pains set in, and after three or four hours she was delivered of a fully developed child that had been dead for some days. I believe that chloroform is the best remedy when inhaled, and can be fully relied upon for removing them: it should be administered as soon as they are distinguished.

The danger of an atonic state of the uterus depends upon whether it be accompanied with hæmorrhage or not. The placenta may still be adherent, but ordinarily it is wholly or partly detached. The indications are to restore power to the system, to excite uterine action, to expel the placenta, and to arrest the hæmorrhage. The difficulty that exists here is, to fulfil the

first three without the hæmorrhage proving fatal in the interval, as it may do. It is under these circumstances that the compress will be found useful in arresting the hæmorrhage—even if it do not excite contraction of the uterus—and giving time for the action of remedies.

If the woman be corpulent, the bandage should first be applied, and over this the compress; or if not, the compress alone will suffice. The belt should be buckled as tightly as possible, having a folded napkin under the buckle to act as a pad, and to prevent its hurting the woman; and it should be further tightened by the tourniquet screw. This being done quickly, a full dose of opium, forty minims or a drachm of the tincture, with the same quantity of the Sp. ammoniæ comp. and a drachm of the tincture of ergot of rye, should be forthwith given in water, and a napkin rinsed out of cold water should be dashed repeatedly on the vulva. The amount of the discharge and the state of the pulse must be carefully watched, and if depression continue, brandy must be liberally given, and the ergot should be repeated. As the depression subsides, the uterus will recover its contractile power, and if the placenta have not been wholly thrown off, it will be so, and by gentle traction of the cord will be expelled.

Denman writes: "When there is a present hæmorrhage, so important as by its violence or continuance to threaten danger, the placenta ought to be immediately extracted out of the cavity of the uterus. This is not an opinion, but a rule of practice."* And previously he states: "The introduction of the hand for the purpose of bringing away a retained placenta is often mentioned as a slight thing; but I am persuaded that every person who attends to the consequences of practice, will think it of importance, and that, if possible, it ought always to be avoided."†

Dr. Ramsbotham remarks: "Are we to remove the placenta immediately hæmorrhage shows itself by introducing the hand into the cavity of the womb; or can we stimulate the uterus to contraction, so as to induce it to throw off the mass without the necessity of so harsh a proceeding? By pressure, friction, and the application of cold, we may frequently excite such efficient action that the placenta will gradually descend into the vagina, and the introduction of the hand be rendered unnecessary. But we must always bear in mind, that these means ought not to be trusted to exclusively and entirely under a continuance of copious dis-

* Vol. ii. p. 333.

† Ib. p. 331.

charge; and that frequently the manual removal of the placenta from the uterine cavity itself, will alone check the flow and place the patient in a state of safety.”* Dr. Rigby writes similarly: “In ordinary cases, a little circular friction with the tips of the fingers over the fundus will generally be sufficient. If the uterus begins to swell, we may grasp it with a sudden but moderate degree of force; or we may give the fundus every now and then a smart jog with our hand. Whilst these measures are pursuing, a dose of *secale cornutum* will be of great service; for even if it does not act soon enough to aid the expulsion of the placenta, it contributes greatly to insure the contraction of the uterus afterwards. If the hæmorrhage nevertheless continues profuse, it will be necessary to introduce the hand into the uterus and remove the half-separated placenta.”† In true inertia, neither friction nor slight pressure can remove “this want of contractile power in the uterus;”‡ even in severe cases, the introduction of the hand may fail to excite it. When there is merely “a suspended action” of it, pressure or friction—which is less preferable as it may excite irregular contraction—will rouse it. Fortunately it is rarely a primary occurrence. Writing on

* Op. cit. p. 410. † Page 216. ‡ Murphy, p. 356.

the introduction of the hand, Mr. Roberton remarks: "It must under all circumstances, however, be extremely desirable to avoid such an operation. I am persuaded, that where the placenta does not *morbidly* adhere to the uterus—an accident less common than some would have us to believe—extraction may in nearly every case be avoided, and effective uterine action secured within half an hour after the birth of the foetus, and generally in half that time."*

Under no circumstances in midwifery practice is the accoucheur placed in a more trying and responsible position, as the life of his patient depends upon the promptitude of his treatment, which, from the necessity of its being immediate, precludes his obtaining aid. He is first directed to use pressure or friction, and cold to the vulva; that he is not justified in introducing the hand unless necessary; and that "if there have already been a hæmorrhage so profuse as to occasion danger, and the common consequences of loss of blood, as fainting and the like, have already followed, the placenta ought not then to be extracted, nor the patient disturbed, nor any change made, till she is somewhat revived from her extreme debility; as the danger would be

* Op. cit. p. 353.

thereby increased, and the patient die, during or immediately after the operation, as I (Dr. Denman) have seen and known in too many instances. In other words, the extraction of the placenta is to be considered as a remedy for a present or an apprehended dangerous hæmorrhage, but cannot remove the effects of one which has already ceased.”* He knows, also, that as the patient recovers the hæmorrhage will probably recur, and may be fatal. Sometimes there would be a timidity, too, in introducing the hand, and afterwards of leaving a portion of the placenta behind; there is the fear, too, of not exciting efficient contraction of the uterus, and the difficulty of subsequently retaining it in a contracted state.

The compress does relieve the accoucheur of these difficulties, and—as will be again referred to when treating of post-partum hæmorrhage—it will temporarily arrest the discharge without the uterus contracting, and thus time is given for the action of remedies, and the uniform pressure of it aids in inducing uterine action.

Dr. Lee directs: “When a dangerous flooding takes place after the delivery of the child, and before the placenta has been expelled, strong pressure should immediately be made over the

* Denman, vol. ii. p. 333.

hypogastrium, in order to excite contraction of the uterus. The binder should be firmly applied around the abdomen, and several napkins, folded into a square form, should be interposed between the binder and the hypogastrium, that the fundus uteri may be forcibly and permanently compressed.”* The confining the uterus in this way would be the difficulty, as it might escape laterally, even were the pressure sufficient. Dr. Lee, also, in his “Clinical Midwifery,” directs that “strong pressure should immediately be made over the hypogastrium, to excite uterine contractions, and the placenta be removed.”† Dr. Lee’s principle of using strong pressure, it is to be hoped, will become more general under such circumstances.

Irregular contraction of the uterus is a cause of the retention of the placenta. It usually succeeds very rapid labour, when, by the uterus continuing to act, it contracts upon itself irregularly; but more commonly it arises from mismanagement, in drawing the child away, instead of allowing the uterus to fully expel it, or in pulling the funis in the hope of extracting the placenta. Any partial stimulation may excite it unequally, therefore friction of the abdomen on this account should be avoided.

* Most Important Diseases of Woman, p. 213.

† Page 197.

The seat of the constriction varies as does the shape of the uterus, according to the set of fibres spasmodically contracting. Ordinarily, it is situated at the cervix, as it is this part that is most irritated by the traction of the cord; or, commencing here, it may extend upwards to the circular fibres of the body of the uterus; "or the anterior portion of the uterus is contracted, whilst the posterior, where the placenta is commonly attached, is relaxed;"* or it may be unsymmetrical in shape from the fibres surrounding the Fallopian tubes on one side only acting, or the circular fibres of the body contracting will produce the hour-glass contraction; and there will be then two "circular constrictions, the one above the other; so that when the hand of the operator has overcome one (the os uteri), he meets a little higher with a second."†

It may or may not be attended with hæmorrhage according to the seat of the stricture. The amount of hæmorrhage also when it occurs will depend considerably on the seat of the stricture; when it exists at the cervix a dangerous and insidious form, called internal hæmorrhage, is apt to occur. When all may have appeared going on favourably to the accoucheur, he may suddenly find his patient threatened with syn-

* Murphy, p. 162.

† Robertson, p. 347.

cope, and the uterus distended to the size it was before delivery.

The treatment should be such as will excite those fibres that are in a passive state to contraction, and thus equalize the action of the uterus, to prevent hæmorrhage, and to effect the expulsion of the placenta. Bleeding has been recommended, but, as has been seen, when it occurs to a far greater extent than would be attempted by venesection, it fails to overcome it, and the danger of inertia that always exists when hæmorrhage occurs would be increased. I believe that a dose of opium—about twenty or thirty minims of the tincture, with firm, uniform, and equable pressure, are the best means of relieving it at its commencement. Dr. Ramsbotham states that “external means seem of little service.”* Dr. Rigby recommends “gentle friction of the fundus.”† Dr. Burns writes “sometimes the sudden application of a cloth dipped in cold water to the belly has the effect of relaxing the spasm, perhaps by exciting rapidly the more universal contraction of the uterus.”‡ It is not justifiable to introduce the hand into the uterus unless other means fail, and the pressure of the compress, or manipulating the fundus uteri with both hands, should first be

* Page 415.

† Page 226.

‡ Page 372.

tried. With inertia there is no difficulty in doing it, and the hæmorrhage diminishes too the probability of inflammation occurring. Here force has to be employed, which at first increases the contraction, and has to be gradually and cautiously overcome. Consequently inflammation or laceration may ensue. Dr. Ramsbotham directs: "If there be no flooding, we may generally wait an hour from the birth of the child, and in the interval we may administer small doses of laudanum occasionally; but if hæmorrhage came on, we should not perform our duty did we delay the employment of more active means a single minute."* When no hæmorrhage occurs, and evidence of irregular contraction exists, the administration of chloroform would probably be as beneficial as in the false pains that occasionally attend labour, and would be worth a trial. If the hæmorrhage be not extensive, it would be advisable first to try well directed pressure, in the hope of exciting "the more universal contraction of the uterus;" should this fail, as I believe it seldom or never will, then the introduction of the hand is called for. We must recollect that we have not only the danger of hæmorrhage to encounter, but also that of inflammation from the introduction

* Page 417.

of the hand, and the risk of injury to the uterus. Dr. Murphy writes: "Wherever, therefore, the placenta is retained, and hæmorrhage occurs, while the uterus seems to be contracted, do not at once decide that there is an hour-glass contraction, and proceed to remove the placenta; rather seek to equalize the contraction of the uterus by pressing firmly, but equally, over the whole fundus; pass the hand posteriorly over its sacral surface, and grasp the sides of the fundus with both hands: this irritation often succeeds in restoring the proper order of uterine contraction and expelling the placenta." "You will find that it is very seldom necessary to enter the cavity of the uterus in these cases."*

If it be determined to introduce the hand into the uterus, the patient should be brought to the edge of the bed, and the left-hand and arm be previously well greased. The fingers should form a wedge which should slowly and carefully be forced through the stricture, taking the funis as a guide, and which should be kept on the stretch with the other hand. The hand must be passed well up into the uterus and above the placenta, and its complete separation ascertained or effected. The uterus must expel the hand, placenta, and clots.

* Page 362.

The placenta may be retained from adhesion to the uterus, and this arises from two causes, from inertia or deficient action of the uterus, and more rarely as the result of inflammation. In both cases it may be partial or complete. In the former, exciting the contractions of the uterus will ordinarily release it; in the latter artificial separation becomes necessary. Morbid adhesion may ordinarily be anticipated when the woman—as she is sure to do from continued suffering—complains of repeated pain during pregnancy. Rest, leeches, and suitable treatment should then be employed. This inflammation can be sometimes traced to injury, at others it would appear to be of an idiopathic character. When we find the uterus partially and equably contracted, and three or four pains have occurred, at the same time that traction of the funis does not cause it to yield, and pressure has been of no avail, we may conclude that it is adherent.

The left hand should be introduced as before mentioned, and it may have to contend with some spasmodic constriction. The funis being taken as the guide, the hand must be passed up to its insertion, and from thence to the margin of the placenta, which is sometimes extremely difficult to detect. The smooth surface of the placenta, and feeling the vessels beneath, may

be some guide should unfortunately—as occasionally occurs—no portion be detached. The fingers should then make their way gradually and cautiously between the placenta and uterus, care being taken to detach the whole thoroughly, so that none should if possible be left behind to continue a draining, or by undergoing decomposition to excite irritative fever, or phlegmasia dolens.

Hæmorrhage after the expulsion of the placenta arises from different causes, and occurs in opposite states of system: it is too—as in hæmorrhage prior to the discharge of the placenta—both external and internal, but more commonly the former. Flooding is the most formidable occurrence that the accoucheur has to encounter, and it becomes more so from the uncertainty of the treatment, which cannot be fully relied on: it may, too, occur after the accoucheur has left the house and his patient in a satisfactory state: “We are *never* perfectly secure against hæmorrhage coming on during the first few hours after delivery, even where everything has turned out as favourably as possible.”*

It may be stated as a general rule that the less discharge a woman has, the more successful has been the skill of the accoucheur, not but

* Rigby, p. 218.

what severe hæmorrhage will occur that is quite beyond his control. On the other hand, unquestionably, women experience larger losses than are necessary from mismanagement, which Dr. Murphy truly states "is by far the most frequent cause of it."* So long as no alarming symptoms have occurred, or threatened syncope has been escaped, too often the accoucheur is satisfied with the result of his treatment, when perhaps, too, nature's efforts have effected more than his own. A large loss, however, more or less enfeebles a woman, protracts convalescence, prevents her making so good a nurse, and is apt to leave her in a nervous excitable state.

It may occur with or without a contracted state of the uterus, after a rapid or lingering labour, and in a plethoric or debilitated state of system.

Hæmorrhage with a contracted state of the uterus is an exceptional case, though it is occasionally met with. It follows sometimes violent action of the uterus—particularly if the os is less yielding than usual—and also introduction of the hand as in turning, and in irregular contraction of the uterus; or it may succeed to the placenta being torn, and a small portion being left behind, or to retained coagula;

* Op. cit. p. 365.

more usually laceration of the os uteri is the cause. It may lead to fatal results. I once saw a case in which the uterus was unusually well contracted, and the placenta thoroughly expelled, and where the flow was as continuous as from venesection, and was received into basin after basin. Cold and other means had been unsuccessfully tried by her accoucheur, and it was not until the woman was in an almost fatal state of exhaustion arrested by compressing the aorta with a tourniquet and pad; which is the treatment when the hæmorrhage proceeds from laceration of the os uteri, as in this instance. Stimulants then must be very cautiously administered, as a little depression, as in ordinary cases of hæmorrhage, which it resembles, hinders the renewal of the bleeding.

Dr. Rigby states that "Cases have occurred where the os uteri has been artificially dilated, when the child was turned and delivered with perfect safety, and the uterus contracted into a hard ball; in fact everything seemed to have passed over favourably; a continued dribbling of blood has remained after labour, which resisted every attempt to check it; friction upon the abdomen and other means for stopping hæmorrhage by inducing firm contraction of the uterus were of no use, for the uterus was already

hard and well contracted; the patient has gradually become exhausted, and at last died: on examination after death, Professor Naegelè has invariably found the os uteri more or less torn.”*

The placenta must be carefully examined to ascertain that it is entire, and if not, and hæmorrhage occur, it can be accounted for, and the introduction of the hand becomes necessary for the removal of the remainder, and stimulants, ergot and opium, should be administered. As in all cases where the hand is introduced, the abdomen should be supported too externally. With retained coagula, pressure, without the introduction of the hand, will suffice.

In other forms of hæmorrhage the continued contraction of the uterus is more or less interfered with. This proceeds from different states of system, in which, however, a want of tonicity prevails. It is met with in plethoric women, in whom the plethora is a source of oppression, and who may be further enervated from excesses; but more commonly in women of a debilitated and relaxed habit, who have borne several children, whose abdominal parietes are relaxed, whose muscular power generally is weak, and whose *vis nervosa* is deficient. In

* Page 259.

both cases tonicity is diminished, and irritability exalted. It succeeds to rapid labour, and to undue hastening of it by drawing away the placenta too quickly, when the uterus may continue to contract and relax with consequent gushes and external hæmorrhage, or irregular contraction of the uterus may exist and internal hæmorrhage occur, when the accumulation of coagula will excite the uterus to contract. In these cases we have undue and irregular action of it.

Again, after prolonged and severe labour, we have sometimes deficient action of the uterus, but in which the uterus is capable of being roused to contraction, and this giving rise to hæmorrhage, may be succeeded by inertia; or deficient action and an exhausted state of the uterus may commence prior to the birth of the child, to be followed by inertia, or it may commence afterwards. These states of the uterus, too, give rise both to external and internal hæmorrhage, the latter occurring when the os uteri is closed by coagula.

Dr. Murphy remarks: "The chief source of the discharge is the venous openings of the uterus. The slender lacerated arteries are not likely to produce the violent flooding sometimes observed; and I cannot perceive, nor can I direct you to, any other means of preventing it

than by securing an efficient contraction of the uterus.”* The veins of the uterus are imbedded closely in the fibres of the uterus in different planes; they do not accompany the arteries, and are much larger than them. From their size they are called sinuses; they consist of small trunks having only a single coat, opening into each other in the tissue of the uterus, and they have no valves, but “when a venous tube of one plane comes to communicate with a venous tube lying in the plane immediately beneath it, the foramen between them is not in the *sides*, but in the *floor* of the higher and more superficial vein, and the opening itself is of a peculiar construction. Looking down into it from above, we see the canal of the vein below, *partially covered by a semilunar or falciform projection*, formed by the lining membrane of the two venous tubes as they meet together by a very acute angle, the lower tube always opening very obliquely into the upper. In the folds of these falciform projections *the* microscope shows the common contractile tissue of the uterus.”† By the contraction of the uterine fibres, these trunks become more or less separated, according to the

* Page 305.

† Prof. Simpson, Northern Journal of Medicine, January, 1846.

amount of it, the semilunar or falciform projections formed by the communications between the different layers of veins acting in the place of valves, and preventing regurgitation from the abdominal veins. On the separation of the placenta, it is from the open mouths of these veins that hæmorrhage occurs, when the communication is not interrupted by contraction of the uterine fibres. "The oblique direction of the veins very much contributes to this effect, because, where two trunks meet at a very acute angle, it requires only a slight contraction of the uterus to produce a valve at the point of junction, and, if the contraction be great, the connexion is broken off."* The arteries of the uterus, as described by John Hunter, "which are not immediately employed in conveying nourishment to it, go on towards the placenta, and, proceeding obliquely between it and the uterus, pass through the decidua without ramifying; just before they enter the placenta, making two or three close spiral turns upon themselves, they open at once into its spongy substance, without any diminution of size, and without passing beyond the surface, as above described. The intention of these spiral turns would appear to be that of diminishing the force of the circulation as it

* Murphy, p. 299.

approaches the spongy substance of the placenta, and is a structure which must lessen the quick motion of the blood in a part where a quick motion of this fluid was not wanted. The size of these curling arteries at this termination is about that of a crow's quill."* Hæmorrhage can only be permanently arrested by contraction of the uterus, but it may be temporarily so by firm and uniform compression on the uterus, which interferes with the circulation through the uterus, at the same time the aorta, common iliacs, and the inferior cava and iliac veins being more or less compressed, the supply of blood from the former is diminished, and regurgitation from the latter into the uterine veins is prevented. And this is a matter of the utmost importance in practice, as will be again referred to.

The uterus, however, may be considerably dilated, and yet no hæmorrhage result. Under these circumstances, irregular contraction may exist where the placenta has been attached, or it may be sufficiently contracted "to raise the falciform valves, and thus partially, but not completely, close the communication between the different venous trunks. The regurgitation

* Observations of certain Parts of the Animal Economy, p. 134.

of blood is at least retarded, although not altogether prevented." Also, "the venous openings on the surface of the uterus are not at all freely exposed: on the contrary, they are often filled up and covered by fragments of the deciduous membrane, by broken tufts of foetal vessels, and by small coagula resting within them, and acting as plugs, which it appears to me (Dr. Murphy) would be quite adequate to prevent the escape of blood when the circulation is not directed strongly towards the uterine surface."* The fact is well known to every accoucheur, and calls for greater vigilance and care.

The depression that more or less succeeds the expulsion of the child has been referred to two causes; one from diminished nervous power, and the other from the sudden removal of pressure off the abdominal veins. The influence of mental emotion has been previously adverted to (p. 32), and how it may arrest the action of the uterus. Consequently the avoidance of all excitement after delivery must be obvious. Frequently, as the result of the nervous shock, and not from chilliness, one or more rigors will occur. When this happens and is not interfered with, hæmorrhage rarely or never occurs, and efficient contraction of the uterus accompanies and suc-

* Murphy, p. 306.

ceeds it. If, however, we are too solicitous, and heat the woman with clothing, instead of a soothing effect resulting from the rigor, and probably sleep, a state of reaction and excitement ensues, and pretty surely hæmorrhage will follow. Dr. Ramsbotham writes: "Having withdrawn from the bed-side and paid some little regard to the arrangement of our own dress, we may offer some words of consolation and congratulation to the patient; make our observations on the pulse, and request another blanket may be thrown over her to prevent any rigor or chilly feeling supervening on the violent perspiration she has suffered."* Although unquestionably cold should be avoided, still of two evils it is better than being over-heated. Probably, next to excitement, there is not a more fruitful source of hæmorrhage, than the apartment or the patient being kept too warm. In the most natural labour rigors are common after delivery, and as before stated do not arise from chilliness; and any interference with them is "meddlesome midwifery," and will very probably be succeeded by a state of excitement and hæmorrhage.

General want of tone resulting from faulty education and neglect of physical development, or from frequent child-bearing and nursing, and

* Op. cit. p. 143.

commonly the two combined, are a very frequent cause of post-partum hæmorrhage. Here the *vis nervosa* is deficient; there is a want too of muscular power; and with this diminished tonicity, the uterus frequently fails to contract efficiently or persistently. This state too is usually accompanied with greater excitability of the nervous system. An emotional state *per se* may paralyse the uterus; the general want of tone favours its relaxation, and the weakened action of the heart from its being deprived of its due stimulus, and the accumulation of blood in the large vessels of the abdomen, adds in such subjects to the dangers of hæmorrhage.

Probably much of the ill success and inefficiency of treatment, results from not sufficiently regarding all these causes as a whole. Thus, some use the bandage to support the uterus only in cases of hæmorrhage, whilst others think it then ought not to be applied: some condemn it entirely, as not only useless but injurious: some think it of more importance after the first day or two: some, that it is useless and injurious until five or six days after delivery, and some think that the efficiency of it depends much upon its immediate application after the birth of the child, and that it acts as an aid—like the abdominal muscles—in supporting the uterus.

Some who use it are particular in its application, and apply it themselves; whilst others leave it to the nurse. It was used by the late Dr. Merriman, during the second stage of labour, when hæmorrhage was anticipated, and is still so by Dr. Lee.

Dr. Lee advocates, too, the rupture of the membranes before the os uteri is dilated, when post-partum hæmorrhage is to be dreaded.* Most writers look with a kind of horror on interfering with them, unless rigid and projecting through the vulva, fearing prolongation of labour, and rigidity of the os uteri from the irritation of the head. Denman mentions premature rupture of them "as the cause of much mischief, and of many tedious or difficult labours. If it be allowed that the membranes containing the waters were intended to be the medium by which the os uteri and other tender parts ought to be dilated, some inconvenience must arise when these are broken and the waters discharged, the head of the child being substituted for them: and this, being a firmer and less accommodating body, cannot for a long time be admitted within the circle of the os uteri, which will of necessity be dilated more untowardly and more painfully. It should also

* Clinical Midwifery, case ix. p. 183.

be observed that, in this state of the parts, the lives of children are sometimes brought into danger, merely from the violent or long-continued compression which the head undergoes.”* Dr. Ramsbotham writes: “It is desirable in practice to preserve the membranous bag entire as long as possible; or, at least, until it has performed the whole office destined for it by nature—namely, the dilatation of the os uteri, the vagina, and somewhat of the external parts. When the membranes appear externally to the vulva, indeed, we may suppose that they have then effected all the good that can be expected from them; that their remaining entire may possibly be retarding the labour; and we may in that case venture to rupture them, provided that the head present. But it is one of the first axioms to be learned in obstetric practice, not officiously or unnecessarily to destroy the cyst, so long as any advantage can be gained by its dilating powers.”† The mean between these extreme opinions has been advocated (page 23)—of rupturing the membranes when the os uteri is dilated.

Besides supporting the uterus and diminishing its contents, so as to reduce its size and increase its contractile power, other means are recom-

* Vol. ii. p. 53.

† Op. cit. p. 105.

mended for exciting contraction to arrest hæmorrhage, which we will now separately examine.

First, pressure of the hand. Dr. Ramsbotham directs a "grasping pressure of the hand to the uterine tumour itself. It is not enough merely to lay the open palm upon the abdomen, and press steadily and flatly; but a squeezing or *kneading* action should be used, by which the organ is prevented filling and becoming distended with blood, and its fibres also are stimulated to contract." "We have proof, indeed, that even the pressure of the hand will not always produce the desired effect."*

Second. Cold is used as a stimulus to excite contraction. Dr. Ramsbotham has fully and carefully written on the various remedies for post-partum hæmorrhage, and directs that after pressure of the hand, "cold may next be resorted to. A napkin soaked in cold vinegar-and-water, may be suddenly laid upon the hypogastric region, and the uterus will often answer the stimulus immediately. A succession of cold cloths may be used in this way, so as to keep the temperature of this part of the body below the standard, and pressure may be used occasionally at the same time." "We may, however, still be foiled, and must resort to other

* Op. cit. p. 434, 435.

measures.”* Burns writes : “ The contraction of the uterus is sometimes powerfully assisted by the application of cold. The quantity of clothes should be lessened so far as to prevent the surface being heated, and the circulation excited ; but our principal expectation is from cold as a topical application, which should be made if the other means fail, but only in that case. Cloths dipped in cold water should be laid suddenly upon the belly, or cold water may be dashed on it. In obstinate cases it has been found useful to project it forcibly with a syringe. It has been proposed to dip a sponge or a piece of cloth in cold water, and carry it in the hollow of the hand into the uterus. Nay, ice itself has been introduced into the womb, but we must not forget the possibility of inducing inflammation by these measures, which can only be justifiable in extreme cases.”† Dr. Rigby remarks : “ The sudden application of cold is a most valuable means ; it acts here solely by the *shock* which it produces at the moment, and not by lowering the circulation and favouring coagulation. Thus we find a cold wet napkin suddenly flapped upon the abdomen, has an immediate effect upon the uterus ; but it ought not to remain on long, and the skin should be dried

* Ib. p. 435, 436.

† Page 511.

with a warm towel, in order that a fresh application of the cold may produce the greater effect. A series of such shocks may be produced by using another wet napkin to the vulva, and a third to the sacrum and loins; an assistant should remove them in the order in which they have been applied, and dry the skin for a repetition of the remedy, if necessary. A still more powerful mode of producing a sudden shock, and thus rousing the uterus to activity, is by a douche of cold water upon the abdomen. This may easily be effected by a teapot or kettle held at some height above and slowly emptied upon the lower part of the abdomen; the uterus will seldom refuse to obey such a stimulus as this, however great may be the inertia into which it has fallen. The inefficiency of a prolonged application of cold to the abdomen, however severe, and the efficiency of the contrary practice is admirably expressed by Dr. Gooch, in his description of a dangerous case of hæmorrhage: "Finding the ice so inefficient, I swept it off, and taking an ewer of cold water, I let its contents fall from a height of several feet upon the belly: the effect was instantaneous; the uterus, which the moment before, had been so soft and indistinct as not to be felt within the abdomen, became small and hard; the bleeding stopped,

and the faintness ceased—a striking proof of the important principle that cold applied with a shock is a more powerful means of producing contraction of the uterus than a greater degree of cold without the shock.”—“An Account of Some of the More Important Diseases Belonging to Women,” by Robert Gooch, M.D.*

Dr. Denman writes: The fainting which follows hæmorrhages was considered as an effect produced, or as a remedy provided for their suppression. It was also said, that the medicines given or the means used did service, according to the degree of chillness they occasioned, and the slackness of the circulation which followed.” “But when the patient becomes cold, and there is apparently the most imminent danger of her dying, we must presume those effects are produced, or no longer regard them, but give without delay nourishment and cordials in small quantities, very often repeated, and the patient must be as it were compelled to live, by the strenuous and constant support we give.” “Yet I (Dr. Denman) must confess, that the best and most genial cordial is very cold air; at least this is indispensably necessary; and the strongest stimulant in extreme cases is, to sprinkle the face repeatedly with cold water,

* Rigby, p. 216.

which the patient, sensible of the benefit she receives, would often require to be done with great earnestness. Chapman mentions a compliment paid him by Sir Richard Blackmore, in a case of this kind, which shows great accuracy of distinction. If, said Sir Richard, you had used less cold applications, this patient would have died from the loss of blood, and if you had continued them longer, you would have extinguished the powers of life.”*

Third. The introduction of the hand is considered a main remedy for exciting contraction of the uterus and arresting hæmorrhage. Burns writes: “But I shall suppose that the placenta has been already expelled before the hæmorrhage comes on, and some of the most appalling cases are of this description, occurring even after the patient is bound up, and laid to rest. The same practice is to be followed, the hand is to be introduced, and pressure made externally, the lower part of the uterus emptied of clots, and the stricture somewhat dilated; the hand is then either to be retained, or reintroduced if it had been withdrawn, and moved gently in the slack part of the womb, to excite if there be hæmorrhage still, or any new clot is to be removed.”† Dr. Churchill remarks: “When all

* Op. cit. p. 353, 354.

† Page 510.

has failed, Dr. Gooch recommends the introduction of the hand into the uterus, for the purpose of exciting it to contract by the irritation. I have no doubt of its success, but it is so hazardous a practice that nothing would in my opinion justify it but the failure of all previous means.”* Mr. Robertson, in describing a case, writes: “Delivery, by turning, was effected with facility, and without being accompanied or followed by hæmorrhage. The placenta was found detached, and was brought away; but the uterus showed no disposition whatever to contract; it lay flaccid in the abdomen. I introduced my hand within it, and at the same time applied friction externally, but without effect; the uterus evinced no contractile tendency more than if it had been a linen bag. In a few minutes after, the woman expired. Here no kind of stimulation was capable of exciting the uterus.” Dr. Rambotham, when cold has failed, recommends “the introduction of the hand into the uterine cavity, as it seldom fails in producing the contraction we desire. The student may be induced to inquire, then, why we should not introduce the hand immediately the hæmorrhage becomes alarming? Because it is better first to adopt less harsh means. The introduction of the hand is always

* Page 413.

to be avoided, if, by any other method, we can produce the same measure of good, without the chance of injury." "Some cases, however, will not yield even to this mode of treatment."* Dr. Lee states: "I am now convinced, from many cases, that the practice so often employed, of passing the hand into the uterus, and pressing its inner surface with the closed fist round and round, to excite it to contract, or to compress the bleeding vessels like a tourniquet, is not only ineffectual for the purpose in the worst cases of this kind of flooding, but that it is attended with mischievous consequences after the flooding has been suppressed."†

Fourth. When the introduction of the hand has failed, Dr. Ramsbotham mentions, "other expedients are recommended—such as injecting a quantity of iced water, vinegar, or other astringents, into the uterus itself; advantage may sometimes be derived from throwing a quantity of cold water into the uterus, but I should fear using strong astringents in the same way, lest inflammation of the uterine tissue, or of its veins, should be induced."‡ Dr. Rigby states that the injection of cold water "frequently proves of the greatest assistance, being capable

* Op. cit. p. 437.

† Clinical Midwifery, p. 197.

‡ Op. cit. p. 437.

of rousing the uterus when other means have failed.”* Dr. Wray bears testimony to its virtue. “Many have been the plans which have been proposed for the arrest of hæmorrhage after delivery. In these fearful cases we have been advised to use cold effusion, to inject cold water into the vagina, to compress the uterus externally, to introduce the hand, to give astringents, stimulants, &c. Amongst all these recommendations, the plan to my mind the most simple and direct, and, in my practice, by far the most effectual, has been omitted. I (Dr. Wray) allude to the injection of cold water into the cavity of the uterus itself. By so doing a stream of cold is secured to the open mouths of the vessels themselves; all clots, &c., which prevent closure are washed away, and the organ, to a matter of almost certainty, is stimulated to contract.”† It has been previously stated, p. 150, that “small coagula resting within them,”—the vessels—aid in closing them, and would not interfere with contraction of the uterus sufficiently to induce hæmorrhage.

Fifth. Pressure by means of a bandage and linen compress is much relied on. “It is in all these cases, states Dr. Rigby, when pressure is

* Page 216.

† Med. Times and Gaz. vol. i. 1853, p. 361.

of so much importance, not for the purpose of producing uterine contraction, as of maintaining it when once excited. By pressure applied at this moment, we may frequently keep the enfeebled uterus in a state of contraction, which, but for this support, would have yielded to the general form of the circulation, and have again expanded.”* Dr. Ramsbotham writes: “While hæmorrhage is going on with any activity, I place no reliance on a bandage, however tight it may be drawn, or with whatever local compresses its action may be aided. I cannot think any folds of linen applied over the uterine region, nor anything in the shape of a tourniquet, as has been recommended (see two papers by Mr. Pretty in the *Med. Gazette*, June 25, 1841, and Dec. 23, 1842), can secure contraction in a manner at all to be compared to the grasping pressure of the hand. We have proof, indeed, that even the pressure of the hand will not always produce the desired effect.”† Burns writes: Pressure “is calculated, though I fear not effectually, to impede distension.”‡ Dr. Murphy writes: “Your object now is much more than to give the uterus moderate support. It is necessary to compress it firmly; therefore, com-

* Murphy, p. 306.

† Page 217.

‡ Page 435.

presses are as essential as the bandage alone is insufficient. For this purpose, several napkins may be prepared: some of them rolled up about the size and shape of folded stockings, may be applied on each side of the uterus; others as pads, above the fundus, but in such a manner that each pad may be larger than that beneath, so as to form a kind of inverted pyramid, pressing down upon the fundus of the uterus. The whole should be kept in their position by the bandage, drawn as tightly as possible over them. When a patient is bound up in this manner, she suffers, when she is recovering, no small inconvenience from the tightness of the bandage: there is the greatest possible desire to take out a pin or two to get relief, and if so, the compresses are all deranged, and perhaps the hæmorrhage may be renewed. A patient who has just escaped the fatal effects of hæmorrhage cannot, therefore be left to herself, or be exposed to the risk of its renewal. If the bandage be unpleasant to bear, cautiously loosen and re-pin it, but if the least draining appears, you must continue the pressure as before." Then speaking of my uterine compress and stating that it has been contrived "on a principle that has been for many years previously acted upon by his father, who had been in the habit of using

a common tourniquet and a pad, made either of cork or a book well padded with a napkin," he remarks, "it seems very well adapted for the purpose."* Dr. Lee writes, "When hæmorrhage follows the natural expulsion of the placenta, or its removal from the uterus by art, there may be either a latent want of uterine contraction, or the contractions may not be permanent, but be followed by relaxation, and the effusion of a large quantity of blood, which may either appear externally, or remain to become coagulated and distend the uterus. For several hours after delivery in some cases this alternate relaxation and contraction goes on, to the great hazard of the patient. By far the most important remedies, and those on which I place the chief reliance in such attacks, are constant and powerful pressure over the uterus, and the application of water to the external parts, and the exhibition of stimulants, particularly wine and brandy. The abdomen should be strongly compressed with the binder, and folded napkins placed under it, and in addition, the hands of an assistant should be applied over the fundus of the uterus."†

Sixth. Electricity has been suggested by Dr. Ramsbotham, and has been successfully used by Dr. Radford and others. The suddenness of

* Pages 359, 360.

† Op. cit. p. 197.

these cases and the prompt treatment that is required, prevent its being made available under such circumstances. Moreover, its effects could be only relied on during its application. These are the means for directly acting on the uterus to stimulate it to contract, and what the accoucheur has to trust to. We will now endeavour to ascertain their relative value. For a remedy to be efficient in arresting post-partum hæmorrhage, it must fulfil three conditions :—

1st. It must excite contraction of the uterus.

2nd. It must retain it in a contracted state.

3rd. It must be of safe application.

First, then, we will examine pressure by the hands. In cases of torpor of the uterus it is a most efficient means of exciting it to contract. Mr. Robertson remarks : “ It is of importance to be aware, that the uterus may be *commanded* by the hand with much facility. Were this fact known and acted upon in floodings, subsequent to the birth of the placenta, it seldom or never would be found necessary to pass the hand into the uterus, to deluge the patient with cold water, or to have recourse to the other expedients, which, together with these, have hitherto been deemed requisite in such emergencies.”* In a case of inertia, when the uterus has been com-

* Op. cit. p. 358.

pared to a wet bladder on which no impression can be made, it may be found to fail, and Dr. Ramsbotham admits it cannot be relied upon. If, however, it succeed in producing the first condition, how is it suitable for effecting the second? Dr. Lee truly remarks, that for "several hours after delivery in some cases this alternate relaxation and contraction goes on, to the great hazard of the patient." Independent of the saving of time, the saving of labour is an object, and I cannot imagine anything more fatiguing and wearisome, especially when tired, perhaps after attending a long and difficult labour, then for many hours—perhaps eighteen or so in extreme cases—to have to use pressure with the hands, even if aided by an assistant. The uterus too may dilate. Dr. Murphy remarks: "You may have followed the contracting uterus with your hand, moderately compressing it, and in a short time you find that it has eluded your grasp, and cannot be felt. Strong frictions over the lower part of the abdomen may excite its action; but it is only for a moment,—again it is lost."* It fulfils the third condition, being of safe application.

Second. Cold does not fulfil these conditions. It may or may not effect the first one, and if it do,

* Page 356.

its effects may be too transient, and only for the moment to be of any value. In the worst cases the loss of nervous power is so extreme as to prevent its producing any salutary effect, and its depressing influence may only hasten the dissolution of the patient. Thus, Denman only recommends cold air, which is always necessary, and to sprinkle the face with cold water; and Dr. Rigby uses it only to produce a shock, avoiding the continued application of it. Its chief value is at the commencement of flooding, and then requires care in its application. It is most successfully used when applied by a napkin rinsed out of cold water, and better still if containing a piece of ice, to the vulva, at first producing a few shocks by its sudden application and withdrawal, and then allowing it to continue; firm pressure being at the same time applied to the abdomen. Mr. Pretty states: "I have known the use of the lower limbs taken away for several months by too long a continuance of cold cloths, yet not longer than the appearance of discharge seemed to warrant. The period of time during which cold cloths were applied, was in one instance half an hour, in the other somewhat longer; yet I have known this period considerably exceeded, without the same bad consequences arising. Perhaps the temperature of the weather, and

the peculiar constitution of the patients might have influenced the effects; but to the impression of cold chiefly, after enduring for many hours severe labour pains, do I attribute the weakness which was experienced by these patients in their lower limbs. One was unable to stand for the space of three months.”* It may, too, induce puerperal peritonitis.

Third. The introduction of the hand is a most painful procedure; and, as has been shown, does not come up to our three requirements. In extreme cases, as has been mentioned, the uterus will not respond to the stimulus of it. It is, therefore, not certain of fulfilling the first indication. Burns depended chiefly upon it, and advises “the pressure of the hand within and without. No remedy can be at all depended on without the use of the hand, and the removal of coagula.”† It does not answer to the second requirement—of retaining the uterus in a contracted state, nor the third in being of safe application. Dr. Murphy writes: “This manipulation causes great irritation—sometimes too great irritation—and therefore requires prudence and caution in its adoption. In cases of great exhaustion, I have known it followed by convulsions and death; but in other instances

* Med. Gaz. 1841, p. 538.

† Page 511.

it proved the only means (accompanied by external pressure) of causing a uniform and efficient contraction of the uterus. Much depends on the condition of the patient. When it is adopted as a "dernier ressort" to excite a flaccid uterus, the shock of the operation sometimes overcomes the patient, already in the last stage of exhaustion, and she never rallies. Such an application of this means is therefore extremely dangerous; but when the uterus is in a semi-contracted state, possessing a certain degree of contractility, the hand may be introduced with benefit."* It therefore follows it may kill the patient from the suffering and shock in extreme exhaustion; and in a semi-contracted state it might not be considered justifiable, "if by any other method we can produce the same measure of good." Dr. Rigby, in cases of internal hæmorrhage, when other measures have failed, directs that the hand, or at least two fingers, should be passed to dislodge the clots, and assist in their expulsion ;"† but he does not recommend the introduction of the hand after the expulsion of the placenta, for arresting external hæmorrhage. Dr. Denman does not advise it; he writes: "We have been directed by gentle dilatation of the os uteri to

* Page 320.

† Page 217.

give these (large coagula) an opportunity of coming away, or even to introduce the hand for this purpose; as by their continuance, they were supposed to keep up the distension of the uterus, and to occasion a continuance of the hæmorrhage, as well as other mischief. Of any advantage said to be derived from this practice I am very doubtful; or whether it may not be suspected to renew or increase, rather than to suppress the hæmorrhage. I have never attempted it.”* Inflammation of the uterus, or its veins, may result from it.

Fourth. The injection of cold water into the uterus cannot be depended on for exciting contraction, although so highly spoken of—for there are cases in which the uterus will not respond to any stimulus; it cannot fulfil the second intention of retaining the uterus in a contracted state, but can do no injury; this does not, however, extend to astringent injections, which may excite inflammation of the uterus or its veins. A syringe, too, may not be at hand when required.

Fifth. Pressure by means of a linen compress and bandage cannot be depended on for exciting contraction of the uterus; and however well the abdomen may be padded and bandaged, and

* Vol. ii. p. 352.

aided too with the additional pressure of the hand, it is questionable if always the uterus can be retained in a contracted state. I believe that the uterine compress will effect this; if not, it will prevent flooding returning, as will again be alluded to.

We will now proceed to examine what may be termed the indirect remedial measures for inducing contraction of the uterus and arresting flooding, so as to ascertain their relative value.

Ergot of rye is a valuable or injurious remedy, according to the circumstances under which it is administered. It has a specific action on the uterus, and a depressing one on the heart. To be efficacious, it should be given at the commencement of hæmorrhage, or prior to it when anticipated; and for this purpose it is sometimes administered just before the expulsion of the child. Its specific effect cannot be relied on; for it "sometimes fails to excite uterine contraction."* The causes of its failure are referred to the quality of the drug, and peculiarities on the part of the mother. The late Dr. Pereira remarked: "I have known increased frequency and fulness of pulse, copious perspiration, and flushed countenance follow the use of ergot during parturition. But in most

* Pereira's *Materia Medica*, vol. ii. p. 926.

instances the opposite effect has been induced; the patient has experienced great faintness, the pulse has been greatly diminished in both frequency and fulness, and the face has become pale or livid.”* When the drug is good, I believe its efficacy will be found greatly to depend upon its influence on the circulatory system; and as it depresses the heart, so will its specific action be diminished or prevented. It should never be given except in combination with the *Sp. ammoniæ comp.*, and small doses of about twenty minims of the *Tinct. opii*. It is contra-indicated in the depression and nervous exhaustion induced by flooding, and probably in irregular contraction of the uterus. It is questionable if it have the power of exciting the latter. When chloroform has been administered, it would be well as a general rule to avoid giving it. Besides the uncertainty of its action, another drawback to its use, is the length of time it takes to act, varying from a quarter to half an hour. The form I prefer of giving it, is the tincture, as it is more convenient, does not take time in preparing, as the infusion,—which having to stand twenty minutes, it may be an hour before you can get the patient under its influence,—is of more certain strength, as it

* Pereira's *Materia Medica*, vol. ii. p. 922.

will not deteriorate by keeping, and the spirit is a useful adjunct in preventing its depressing the heart.

Stimulants are absolutely necessary to prevent syncope, and to avert thorough inertia of the uterus. As has been before stated, the relaxation of the uterus is dependent upon diminished nervous and muscular power, with a depressed state of the circulatory system. By increasing the action of the heart, the nervous power is increased too, and consequently that of the uterus. In giving them, effect and not quantity must be the rule. Brandy is the most suitable, not too much diluted with cold water.

Opium is a most important remedy, and will be required in different doses, according to the circumstances of the case. If the circulation be tranquil, and the amount of hæmorrhage be not great, and depending upon a torpid state of uterus, twenty minims of the tincture combined with ergot and ammonia should be given. If, however, it be excited, and the pulse jerking in character and weak, small doses of opium would only increase the excitement. As tonicity becomes lessened, irritability is exalted, and at last the latter too becomes exhausted: the palpitating heart and nervous excitability that accompany debility are familiar to every one.

Under such circumstances, a slight stimulus would excite, a more powerful one would soothe. They who object to large doses of opium, would say, That is just what we assert; we want to excite the uterus and not to diminish its action, and that is why we object to large doses of this drug. Dr. Ramsbotham writes: "Opium certainly acts as a cordial, lulling the irritability of the patient, and producing a sleep, or at any rate a composing stupor; but it takes off both muscular and uterine action: it disables the uterus, therefore, from contracting, even were it so disposed: and if the proposition be true, that on the contraction of the uterus alone we are to rely for the patient's ultimate safety, it cannot but appear contradictory to resort to a medicine whose very action tends to prevent the effect desired. It has been objected, that although opium in small quantities takes away uterine action, yet in large doses it produces the very opposite results, and excites contraction. This proposition is at variance with common sense, with all analogy of the effects of other drugs, and at least with my experience."* The effect of opium depends upon the dose and the state of the patient; it acts at first as a stimulant or "cordial," and like other stimulants,

* Page 438.

it must to a certain extent be given according to its effects, and the amount of depression of the patient. It is most important in cases of flooding, to lull the irritability of the patient. "Over sensibility is generally conjoined with excess of irritability and want of tone," and a cause of this is "the reaction ensuing after great losses of blood."* "The medicines most in opposition to this element of disease, are narcotics or anodynes, such as opium, &c., administered internally. These diminish nervous sensibility; and in proportion as this is exalted, the system will bear larger doses."† "Where tonicity is defective, the muscles are flabby and incapable of continued exertion, but sometimes are too irritable, with the tremulousness of debility. The heart likewise is irritable, and often exhausts its strength in palpitation."‡ Now, regulating muscular action is no evidence of weakening it; and it is important to bear in mind the difference between voluntary and involuntary muscular action, and the effect of irritability upon the latter. The strength of the irritable heart is soon expended, and its systolic action sometimes does not reach distant arteries until the termination of its diastole.

* Williams' Principles of Medicine, p. 57.

† Ib. p. 58.

‡ Ib. p. 56.

Here we have a short impulsive movement which tells upon the adjacent parts, but from want of power is not sufficiently prolonged. "Inordinate readiness or quickness of contraction constitutes mobility of muscle, a slight stimulus causing it to contract. This often co-exists with a want of power or completeness in the contractions."* Whereas in tonicity there is "a tendency to slow, moderate contraction, not essentially terminating in relaxation."† We cannot call the excitability of the consumptive man strength, nor the torpor of the plethoric one debility. The action of the uterus must depend upon the state of tonicity of its muscular fibres, and how it is influenced by the nervous system. Its tonicity will depend upon the amount of tonicity generally, the supply of arterial blood to it, and from its not having been exhausted by excessive action. "Excessive mental emotion, of a kind not in itself depressing, may occasion the sudden cessation of the heart's action, and a general loss of muscular contractility; and it is well known that muscular power is greatly diminished by emotions which produce no other direct action."‡ Increased irritability may affect the uterus in two ways.

* Williams' Principles of Medicine, p. 50.

† Ib. i. 53.

‡ Carpenter's Physiology, 308.

If the woman be alarmed from observing fear and anxiety in those around her—from the increased emotional state that accompanies this exalted irritability, the uterus may be paralyzed, and fatal hæmorrhage result; hence the great importance of the accoucheur preserving his self-possession in cases of dangerous hæmorrhage;—in fact, the greater the danger, the greater is the necessity for his so doing. 2ndly: From the excited state of the nervous system, and the want of tone, “the contractions (of the uterus) may not be permanent, but be followed by relaxation, and the effusion of a large quantity of blood.” “For several hours after delivery in some cases, this alternate relaxation and contraction goes on, to the great hazard of the patient.”* In the former case, the opium aids in restoring tone and tranquillizing the patient; in the latter it checks also the excessive irritability, and assists in converting an unnatural or diseased action into a healthy one. On the same principle we give opium in delirium tremens, and do not find that it diminishes the power of the heart. Dr. Ramsbotham further remarks: “I have often seen at the *commencement* of labour, uterine action suspended by what would be considered a large dose of opium; and if the same quantity

* Lee, p. 197.

will take away action at the beginning of the process, is it reasonable to suppose it will excite it at the termination?"* There is reason for believing that at first the nerves are more immediately connected with the process of parturition, for the pains then are chiefly felt in the back; consequently, what will quiet the nervous system, will sometimes *for a time* lull the pains. It has been stated, page 69, that chloroform may at first check the action of the uterus from its calmative effect on the nervous system, and consequently from its temporarily depriving the uterus of its previous stimulus. But when the uterus is thoroughly engaged, it is independent of the nervous system, though influenced and aided by it, page 29; for "the contractions of the uterus itself are independent of all connexion with the nervous system," page 30. We cannot, however, remove uterine contraction indefinitely by either opium or chloroform. The action of the uterus in fact depends upon a power inherent in its muscular tissue; and when once thoroughly roused, will under ordinary circumstances continue until the necessity for it ceases. If, however, tonicity is impaired, the contractile power of muscular fibre generally, is so too; consequently uterine

* Page 438.

action is diminished: the nervous system then becomes more sensitive, and with increased irritability may affect the uterus in the manner before mentioned, pages 177 and 178. As has been before stated, page 177, the action of the uterus depends upon the state of tonicity of its muscular fibres, and how it is influenced by the nervous system, it becomes intelligible why opium should aid its action at the termination of delivery. That "it takes off both muscular and uterine action, and that it disables the uterus,"* is not so easy of explanation; for Dr. Carpenter remarks: "It is indeed a curious fact corroborative of what has just been said of the influence of narcotics, that the ganglionic nerves much sooner lose their power of exciting these muscles to contract when themselves irritated, than the muscles lose their power of contracting when directly stimulated."† It is not argued that a full dose of opium interferes with the action of the spinal and ganglionic nerves; the former must be destroyed before the latter, and the latter before the muscular fibres of the uterus lose their contractility. The muscles of organic life "appear to be, in the living body, much seldomer called into contraction through their nerves, than they are by stimuli applied

* Ramsbotham, p. 438.

† Op. cit. p. 301.

directly to themselves," page 33. It may then be assumed that opium does not diminish the contractile power of the uterus. The late Dr. Pereira wrote: "Opium is at times serviceable to obviate certain *ill effects of hæmorrhage*; as when there is great irritability attended with a small frequent pulse, and also to relieve that painful throbbing about the head so often observed after large evacuations of blood. In or immediately after *uterine hæmorrhage*, the use of opium has been objected to, on the ground that it might prevent the contraction of the womb; but where the employment of opium is otherwise indicated, this theoretical objection deserves no weight."* As the debility from loss of blood increases, so does the irritability become exhausted, and thus the uterus—weakened too by previous exertion—cannot be excited to contract. "The large amount of stimulants borne by patients whose irritability is reduced by accident or disease, is a remarkable feature in their history."† Dr. Murphy remarks—"Opium is both a stimulant and a sedative, and that one effect or the other is produced, according to the relation existing between the nervous energy of the uterus, and the dose of the medicine

* Elements of Materia Medica, p. 1765.

† Williams, op. cit. p. 52.

given; and that the sedative property of the medicine will not be observed until the nervous energy is restored;”* and then it is useful in preventing reaction occurring. He gives it “to restore the tonic contractile power of the uterus,” and directs if “there be great exhaustion, the patient should be given a drachm of tincture of opium in brandy: this may be repeated in more moderate doses, until the pulse becomes steady.”† Dr. Burns writes: “Opiates are of great service in all cases of uterine hæmorrhage after delivery. They are among the safest and best cordials we can employ; and must, in every instance, be exhibited. The dose ought to be proportioned to the urgency, varying from fifty to sixty drops. In some instances, when the debility was great, a hundred drops of the tincture, or when the stomach was very irritable, five grains of soft opium, have been given at once, and afterwards three grains every three hours, till the patient was out of danger. But I do not consider such large doses of laudanum to be necessary; and as for the solid opium, it ought to be given in doses only of a grain, to allay the irritability of the stomach, after the pressing danger is past; for in no dose can it act instantly, or be depended on in urgency. Moderate doses of laudanum

* Page 318.

† Page 357.

by the stomach or in clysters, never prevent the contraction of the uterus, or produce afterwards any bad effect. Opiates supply, in so far, the place of wine, and are infinitely safer; at the same time, we must not neglect wine or brandy, as the one assists the other, and those last stimuli are more immediate in their effects, a property which is of essential importance.”* Opium does what sleep accomplishes; it restores tone generally, not only to the heart but also to the bloodvessels, enabling them to contract on their diminished contents. Although experience fully testifies to the value of stimulants and opium, still they sometimes fail to produce their effects; the hæmorrhage exhausts faster than these medicines aid, or the system may have sunk beyond the means of restoring it, or sickness prevents their retention. In ordinary kinds of hæmorrhage, the syncope favours its arrest; here it is accompanied with dilatation of the uterus, which is part of the general relaxation, and hæmorrhage recurs should the woman survive it, and has to be arrested by rousing the uterus to action. If, however, the weakness increases from loss of blood, the uterus loses its irritability before the heart, and it then cannot be excited to contract, and no longer—as when

* Burns, 125.

death occurs from other causes—"is the *ultima moriens* of the ganglionic system," page 31. Severe labour and debility favour, too, this extinction of irritability.

The application of the child to the mother's breast is recommended by Dr. Rigby as not "less valuable for preventing any return of the hæmorrhage than for stopping it in the first instance."* Dr. Ramsbotham remarks: "If the trial can be made, without disturbing the patient much, I see no objection to its adoption."† As an aid it is deserving of attention, but I should not feel disposed to place full reliance upon it. Often there is a difficulty in getting the child to take the breast, and if there be no milk, any sympathetic action that may be induced, may be only transient.

What then is to be done if all these means fail, and the irritability of the uterus is exhausted and the woman *in extremis*? Dr. Ramsbotham admits they do so, and states that "our last resource is the transfusion of blood into the system of the dying patient,—a means deemed by some most powerful in arresting the vital spirit, even as it flutters with tremulous delay upon the lip."‡ The operation is not easily performed, the woman may die before it

* Page 437.

† Page 437.

‡ Page 438.

can be done, and if not, what is there to prevent the blood that has been injected escaping, as that of the patient had previously. Moreover, there is always the danger of air being introduced into the veins. Dr. Murphy states that he has "witnessed three cases, in which transfusion was performed without any accident: they all died. Dr. Blundell's objection might be offered. It might be said, that the operation was performed too late; but I (Dr. Murphy) do not believe such an objection is valid. Transfusion is extremely hazardous, and if there was a reasonable chance of saving the patient by other means, we would not venture on the experiment."*

We may then fairly conclude, that the means enumerated are not equal to the arrest of post-partum hæmorrhage; and we find such to be the case. The accoucheur is directed to do one thing after another; thus, Dr. Ramsbotham directs first—"the grasping pressure of the hand," and afterwards states that "we have proof, indeed, that even the pressure of the hand will not always produce the desired effect;" then cold is advised, and he then remarks—"we may, however, still be foiled, and must resort to other measures." The introduction of the hand

* Page 322.

into the uterine cavity is then to be put in practice, and this may be unsuccessful too. All this time hæmorrhage is going on, exhaustion threatening, and the accoucheur in these terrible cases knows that his treatment cannot be depended on. Dr. Churchill's statistics give the rate of mortality of about one in twelve* in the practices of our first accoucheurs. Probably in ordinary midwifery practice it is higher. These too are cases proving immediately fatal, but we have no statistics to inform us of the number of fatal cases subsequently occurring, and in which death was attributable to the hæmorrhage, or the treatment for the arrest of it. We have no account of the evils to the mother resulting from great losses of blood when life has been barely saved, or of the evils to the child from the mother not being able to nurse it sufficiently. Mr. Roberton truly remarks: "More women die of hæmorrhage succeeding labour than, probably, from any single accident in childbed whatever. But this is not the only consequence of importance: multitudes who recover from its immediate effects, and whose lives have been in no actual danger, are yet, in various degrees injured by it; as is shown by symptoms which are too often regarded as being incidental to the

* Second Ed. p. 398.

puerperal state—a sallow complexion, a quickened, feeble pulse, flaccid breasts, thin watery milk, a sickly flatulent stomach, irritability of temper, and a lingering recovery. I (Mr. Robertson) am not here referring to severe cases, in which there is intense headache, febrile reaction, and all the train of symptoms which follow exhausting hæmorrhage, so well described by Dr. M. Hall, but to those of a slighter description, which generally attract no particular notice.”*

We may then assume that further means are wanting :

1st. To prevent exhausting losses of blood, injurious subsequently to mother and child, if they do not at the time tend to inertia of the uterus.

2nd. To arrest hæmorrhage when the uterus is in that atonic state that it cannot be stimulated to contract.

3rd. To retain the uterus in a contracted state, and to prevent hæmorrhage occurring after the accoucheur has left his patient.

It has been stated that the means for checking uterine hæmorrhage are uncertain in their operation. In many cases, women all but bleed to death, and yet recover ; in others a fatal syncope may occur and the uterus be insensible to

stimulation. It cannot be doubted that women generally lose more than is necessary, and little is thought about it, as the incorrect popular impression exists, that a large loss is useful in cleansing them, and some will attribute their not being so well after a confinement to not having had as free a discharge as usual; and occasionally the doctor is blamed for having done something to check it. Although death does occasionally result from a large gush accompanying the birth of the child; yet, if the uterus contract with it, and no hæmorrhage ensue, this loss will not tell on the heart, as the uterus has then merely discharged the blood it contained. Dr. Denman writes: "It has often been a matter of great surprise to me, when I have seen a patient bear a sudden discharge of what seemed an enormous quantity of blood on the coming away of the placenta, without fainting, or showing any signs of the common consequences of great loss of blood; but it may be explained in this manner. Should every drop of blood which circulates in the uterus be discharged in an instant, it would be of no immediate consequence to the patient, the very existence of the uterus not being necessary for her life. When all this blood is discharged, if the uterus should contract speedily, so that the

vessels should be reduced to a small size, there would not be a continuance or return of the hæmorrhage, and the patient would exhibit no signs of suffering from that which has happened. But after the discharge of the blood contained in the vessels of the uterus, as before stated, if there should be no contraction of the uterus, then the vessels remaining of the same size, and the communication between the body and the uterus being preserved open, as in pregnancy, the vessels of the uterus would be replenished from the constitution, and the same effect would be produced in the patient as if it were really lost. Should this second quantity of blood supplied to the uterus be discharged, and another be claimed from the constitution, then, according to the quantity demanded, and the number of times the demand was made, would of course be the danger of the patient.”* It must however be most desirable for the woman’s future well-doing to save the first loss, and no means are so likely to effect this as following down the contractions of the uterus during the birth of the child, as advised by Professor Murphy.

If, however, a gush of blood should occur during the birth of the child and a draining continue, or should it happen before the expul-

* Vol. ii. p. 348.

sion of the placenta, what is to be done? If the woman be corpulent, the bandage should be properly applied (page 98) and the compress (page 95) over it, or if not, the compress alone will suffice: having fastened it securely, the tourniquet should further tighten the bandage. A draught of ergot, ammonia, and opium (page 122), should then be given. If the hæmorrhage occur from imperfect contraction of the uterus and detachment of the placenta, the pressure will complete the contraction of the uterus, and with this the separation of the placenta. Partial adhesion of the placenta ordinarily is the result of faulty contraction, and which fails to completely detach it; should, however, it be partially morbidly adherent—for when it is so entirely no hæmorrhage occurs—we save the hæmorrhage, and then, failing to remove the placenta, we can but interfere; whereas it is a disputed point in practice if it be justifiable to introduce the hand at once the hæmorrhage occurs (pages 132 and 133). If the depression be severe, a larger dose of laudanum will be necessary, with stimulants, the shock of a napkin rinsed out of cold water to the vulva, and tightening the compress. By these means the hæmorrhage will be arrested, and gentle traction

may be made on the funis, waiting if possible for a pain, when it will probably yield, or if not, the woman may be requested to bear down a little, when it will descend, and on its expulsion the compress should be further tightened. If a draining continue and no depression exist, the ergot draught should be repeated, and cold napkins to the vulva. The hæmorrhage will thus be checked, and exhaustion and inertia of the uterus be prevented. Under these circumstances it is necessary to attend to the temperature of the room, keeping it cool, with a current of air through it, and the patient too, by not allowing her to be overclothed.

When, however, severe depression exists with continued hæmorrhage only checked for a time by the faintness of the patient, and the uterus cannot be excited to contract, what is to be done? We have seen that the only resource—transfusion, fails; cannot we then, or previously, instead of injecting the blood of another, prevent that of the woman escaping without contraction of the uterus? for if this be possible, life might be saved. The effect of the introduction of the hand under such circumstances has been mentioned, p. 169. Ulsamer, Baudelocque, Chailly, and others have advocated the compression of

the aorta by the hand, and have supposed that by stopping the supply of blood to the uterus in those fearful cases, the hæmorrhage would be arrested. Now, independent of the great fatigue that such a procedure for several hours would occasion, it would fail in its results. Dr. Murphy has remarked: "We cannot well compress the aorta without also compressing the cava and bifurcation of the iliac veins, which seems to me of equal, if not of greater importance, because the veins are a great source of flooding, and if we can prevent the regurgitation of blood from these great trunks into the uterine veins, an important means of prevention is accomplished."* The compression of the aorta would answer, and is, in fact, the only remedy for hæmorrhage with a contracted uterus and laceration of the os, p. 144; but with an uncontracted uterus the veins would be refilled, not by the arteries, but by the abdominal veins. Mr. Pretty states: "In casual conversation with the late Mr. Walford, teacher of midwifery in the Aldersgate-street School, upon the treatment of uterine hæmorrhage after delivery, he suggested to me the application of pressure by means of the tourniquet as certain of success; and such was his confidence in this means, that

* Page 321.

he emphatically declared, that no woman ought to die of uterine hæmorrhage; and that any practitioner of midwifery losing a woman from this cause ought to suffer the punishment due to the crime of manslaughter. From having had some experience in these frightful cases, and more especially from its occurrence twice in my own domestic circle, each time producing all but fatal syncope, notwithstanding every care was taken to guard against such a lamentable result by the attendance of a kind and talented physician-accoucheur; and knowing the great difficulty of successfully treating and managing such cases, they have been a subject particularly interesting to me. It is in cases of flooding after delivery that I have found the use of the tourniquet so highly satisfactory, and I strongly recommend its employment to all accoucheurs. I believe that the tourniquet will not only arrest the violent and large discharges of blood from the uterus, but will likewise prevent that slow draining away of it, which, without producing syncope, is oftentimes the cause of great exhaustion and a long convalescence. It will likewise relieve the practitioner of much bodily exertion, and materially abridge the period of watchfulness; for feeling assured that his patient is safe, all painful anxiety is removed from

his mind. I (Mr. Pretty) am disposed to think the most eligible compress might be made of a piece of cork, about an inch in thickness, covered with soft leather, and shaped somewhat to the inferior and anterior aspect of the abdomen; this would be sufficiently firm to yield uniform pressure over the uterus without giving any pain, which I have found the corners of a book apt to do. This instrument is not easily displaced, as the band is passed beneath the back and over the ilia, and by turning the screw placed with the compress over the uterus, pressure is effected directly downwards upon it, and such a compression of the bleeding vessels or sinuses takes place, that uterine hæmorrhage must be restrained in almost every case: indeed, as Mr. Walford said, it might be carried to such an extent as to suspend the circulation in the abdominal aorta. In thin persons, no doubt, it might effect this object; and if so, few women ought to die of flooding after delivery. I (Mr. Pretty) recollect, when a pupil, having been sent for the late Dr. Batty, to assist in a case of flooding, and he being unable immediately to attend, directed me to inform the gentleman in attendance that if it continued he was to place the whole weight of his body upon the patient's abdomen, by sitting astride her till he came;

but the patient did well without this extraordinary help.”*

Having experienced the great value of the tourniquet and a small pad in arresting uterine hæmorrhage, I invented the compress,† by which I endeavoured to avail myself of the efficient pressure of the tourniquet, and at the same time to carry out Dr. Murphy’s principle of pressing on and around the uterus, which he effected by a series of linen compresses that were confined by the ordinary bandage.‡ A powerful pressure can only be safely employed when it is uniform, and I believe that it will temporarily act as contraction does, by preventing the venous sinuses becoming distended with blood, and that when tightened to the utmost, that it will interfere with the circulation through the abdominal vessels, p. 149. For by twisting the tourniquet you not only can regulate the pressure to any amount, and tighten the belt, but from the webbing being threaded so as to pass out above the rollers, as you turn the screw you force inwards the compress, if you wish, to the extent of the length of the screw. The compress is so shaped as to prevent the uterus

* Med. Gaz. June 25, 1841. Dec. 23, 1842.

† Ib. January, 1846.

‡ Lectures on Parturition, p. 359.

escaping laterally from the pressure, and to press well above the fundus should the uterus be contracted. To assert that post-partum hæmorrhage can be temporarily arrested without contraction of the uterus, although a matter of the greatest importance, and on which life in many cases will depend, is so at variance with the prevailing rules of practice as to render it very difficult to induce prejudice and custom to be thrown aside. Many would not be contented with the hæmorrhage being arrested, unless they were aware that the uterus was contracted too. Not only is time lost in attempting to effect what cannot sometimes be accomplished, or if so, is only temporary; but the treatment too probably in many cases rather hastens the dissolution. Denman states that he "never troubled himself with the state of the uterus unless it were inverted after the placenta was brought away."* But of course no accoucheur would feel justified in leaving his patient unless the uterus were contracted, or she were secured from a renewal of the hæmorrhage. One would suppose too, that such a means of arresting flooding would be a great boon to the accoucheur in relieving him from anxiety and fatigue.

When the hæmorrhage is or has been exten-

* Vol. ii. p. 352.

sive, and the pulse is failing, with gaping, and pallidity of the countenance, the compress should be tightened to the utmost with the belt and buckle, and then by the screw. A full dose of laudanum with brandy should then be at once given, and repeated in doses as before mentioned, p. 182 and 190. A napkin rinsed out of cold water should be repeatedly dashed on the vulva, and then applied to it. Some crushed ice in the cloth is most useful in arresting any slight draining. As the woman rallies, some nourishment should be given—none better than a raw egg beaten up with brandy-and-water. The legs should be kept warm, and a current of air kept up in the room. Denman's mode of using cold in these cases by sprinkling the face with cold water, or still better, producing a shock by dabbing it with a wet towel, is of great use in removing the syncope. All this may be done in a minute or two, and the patient's life may depend upon the delay of a minute. I should not fear trusting alone to pressure with opium and stimulants, still, however, it is wise to use cold to the vulva and face as an aid—but to depend upon it in extreme cases of exhaustion in the hope of exciting contraction of the uterus, is trusting to a broken reed, and death will only be hastened by the depression that it will pro-

duce. The hæmorrhage is thus arrested, but the uterus probably not contracted; the system rallies, the pressure of the compress acts as a stimulus, and contraction follows. What more can be desired? You have an effective and safe mode of treatment, whereas other methods for arresting it are neither the one nor the other.

If, however, contraction of the uterus has been effected, how is it to be retained in this state? This is a question of much importance to the accoucheur, as relaxation, hæmorrhage, and death may occur after he has left the house. Nor is this a mere surmise, but a fact. A case came to the author's knowledge of this kind. A lady living a few miles from town was confined of her first child, after about four hours' ordinarily severe labour. No hæmorrhage occurred; the placenta came away without any trouble; in short, nothing unusual happened. The accoucheur stayed half an hour afterwards, and before leaving congratulated the husband on his wife having done so well. About two hours afterwards she felt faint, the doctor was sent for, and before he could arrive she was a corpse, death having been caused by internal hæmorrhage. Now, with the compress it is not too much to state, that internal hæmorrhage could not have occurred. If contraction have been

effected, it will retain it in that state, and dilatation could not occur. Internal hæmorrhage is particularly dangerous, from no warning being given, and if slight it is followed by more or less severe after-pains, or it may give rise to fearful and fatal external hæmorrhage after the accoucheur has left the house, the uterus contracting and relaxing in the manner so faithfully described by Dr. Lee, and a continued draining with gushes occurring. Dr. Ramsbotham mentions a case in which the lady always flooded to such an extent as to give him very serious alarm. In her first confinement she had three medical gentlemen, who thought it almost impossible that she could survive. Dr. Ramsbotham attended her in six succeeding deliveries. In the sixth he gave ergot just before the birth of the head, and immediately it was expelled. "This seemed to produce increased uterine action; the placenta was speedily thrown off, with very little discharge, and with the exception of a slight degree of nervous faintness, nothing occurred to give us the slightest uneasiness." Any depression in such a case would be attended with considerable danger; how far it was dependent upon the ergot or upon the removal of pressure off the large bloodvessels of the abdomen, is a matter of conjecture. Still,

under either circumstance, combining the ergot with ammonia and small doses of laudanum, p. 122, would ordinarily be useful. In the seventh confinement, Dr. Ramsbotham remarks: "I arrived this time, about one o'clock; I found the os uteri almost entirely dilated, and the pains active. She was in good spirits, and everything promised well. At two the membranes broke, and at half-past two the child was born; the face presented to the left groin. Soon after the membranes ruptured, I (Dr. Ramsbotham) gave her a dose of Batley's liquor ergotæ, and another about ten minutes before the head passed. The uterus acted strongly, and there was not the slightest stain of blood upon the child's expulsion. In about fifteen minutes, a powerful contraction occurred, and with it a very copious gush of blood; but the placenta did not descend. This induced me to introduce my hand for its removal. It was very firmly adherent throughout about one-third of its extent, and its separation gave me considerable trouble. The uterus contracted extremely well, and there was no more loss of blood." She was then closely watched for more than an hour; "during the whole of this time, the uterus remained perfectly firm, and there was no more discharge than is common." We (Dr. Ramsbotham and Mr. Brown

of Brixton) then left together, considering her quite safe. "In about an hour after, they summoned him (Mr. Brown) back in great alarm, as she became 'faint and blue.' He found there had been considerable hæmorrhage since we had left, and that she had fainted. He immediately dispatched the carriage for me. I (Dr. R.), however, did not reach my own house till past seven, and it wanted only fifteen minutes to eight when I arrived at my patient's. I was told that she had flooded a good deal externally, that she had been cold and pulseless, and that the means which had been tried to stay the hæmorrhage had been of no avail. She had rallied somewhat, but was still exceedingly blanched, and looked distressed; the uterus was much larger than when I had left her; there was a continued draining going on, and every four or five minutes a violent after-pain. I immediately introduced my hand, for the purpose of taking away the coagula which the uterus evidently contained. I had some difficulty in passing it into the cavity, from the resistance I met with in the mouth and neck, which had closed like a firm ring. However, I removed from it nearly half a pound of compressed fibrinous coagulum, and from the vagina almost as much, which was loose and soft. She had

no more of those violent pains from that time; the draining ceased, she lost her anxious look, the pulse gradually became firmer, and the faintness disappeared. She was placed comfortably in bed about ten, and I soon after took my departure; she has progressed to her usual good state of health without a check, and is nursing her infant satisfactorily.”*

This case is full of interest, which is increased from its having been treated by so able an accoucheur as Dr. Ramsbotham. For the sake of profiting by it, we will examine some of the particulars of it. In the first instance, it may be remarked that some women have a tendency to hæmorrhage, or a *molimen hæmorrhagicum*, as it is termed. Such was the case with this lady. She had flooded fearfully in all her confinements, save the sixth—seven in number. In her first it was thought impossible for her to survive. We have no account of the result of treatment until we come to the sixth. Here ergot was given just before the birth of the head, and directly after the expulsion of the child, and no hæmorrhage occurred, or anything to occasion the least uneasiness, save a slight degree of nervous faintness. How far the ergot was the means of inducing this faintness, page 173, must

* Med. Times and Gaz. p. 341, Oct. 6, 1855.

be a matter of surmise. Its occurrence *with* it favoured hæmorrhage, from more or less relaxation of the uterus accompanying such a state—still it did not happen. Did this syncopal threatening avert instead of inducing hæmorrhage, as it usually does? if so, this would be an exceptional case. This is highly probable, from its overcoming the *molimen hæmorrhagicum*. In the succeeding confinement, ergot was again used, but it was given twice before the expulsion of the child. No syncope occurred; the uterus acted powerfully, and there was a very copious gush of blood. On the introduction of the hand the placenta was found partially and firmly adherent. On being removed, the uterus contracted firmly, and continued so under observation for an hour. In an hour afterwards, hæmorrhage leading to syncope had occurred. From the difficulty in passing the hand into the cavity of the uterus, from the resistance met with in the mouth and neck, which had closed like a very firm ring, there can be no doubt that irregular contraction existed, and which was probably induced by the introduction of the hand for the removal of the placenta, and which, under the stimulus of the ergot, prevented its being at first partial in extent. As the effects of the ergot subsided, the irregular contraction

showed itself, and hæmorrhage ensued. Two things are certain—viz., that the ergot failed to prevent the recurrence of hæmorrhage, as also did the introduction of the hand, which was rendered necessary by the partial adhesion of the placenta. Again, we know that a clot of nearly half a pound, will escape many hours after labour with an after-pain, and without external hæmorrhage, and that *per se* it is insufficient to account for such a dangerous state as existed. It is a question, too, if firm pressure had been applied to the uterus, if this partial relaxation would have occurred. Again, had it been applied, and a moderate dose of opium given when the hæmorrhage recurred, it is not improbable that the irregular contraction would have been overcome, and the coagulum expelled. By such means, the fundus uteri would have perhaps acted without the circular fibres contracting at the same time with increased force; at all events, the pressure might have preserved a generally contracted state of the uterus, and which not occurring allowed of the hæmorrhage taking place. The hand a second time was passed into the uterus with some difficulty, from the resistance met with; and on the removal of the coagulum, the case terminated far more favourably than could have been expected.

The danger and objections to the introduction of the hand have been before alluded to, pages 138, 139, 140, 160, and 161. Unquestionably, in this case, it was the means of saving life. Dr. Ramsbotham thinks from the powerful contraction of the uterus, the more fluid parts of the coagulum are squeezed out, and that the fibrinous mass thus left, becomes glued to the internal surface with a tenacity almost equal to that of an adherent placenta. It, however, has been seen that hæmorrhage existed during the whole time of the retention of this coagulum; consequently, it and this adhesion occurring together have to be explained. Dr. Ramsbotham further remarks: "The withdrawal of the coagula by the hand at once puts a stop to the agonizing pains and the further loss of blood. I know no case, indeed, in which instantaneous ease and immediate safety follow more directly on the performance of any operation whatever. Nor is it probable that the hand will require to be introduced a second time; for, as the uterus has a disposition to contract, it will exert that power efficiently as soon as the obstructing cause is taken away, and by so doing will seal the bleeding vessels." But what is there to prevent its again relaxing, and subsequent hæmorrhage? In this case, after

the first introduction of the hand, the uterus remained "perfectly firm for more than an hour," and was succeeded by this severe hæmorrhage. We read that she was placed comfortably in bed about ten, soon after which the doctor took his departure.* After very dangerous and nearly fatal hæmorrhage, as a general rule it may be stated that the patient should not be disturbed for several hours afterwards, for fear of any movement renewing the hæmorrhage. Dr. Murphy places much reliance upon sleep for

* Since these pages were sent to press, a case has been reported by Mr. R. M. Nunn, of Wexford, Ireland, in which the *molimen hæmorrhagicum* existed to an equally great degree as in Dr. Ramsbotham's. Full doses of carefully prepared infusion of ergot were given unsuccessfully. "With the expulsion of the placenta came an overwhelming torrent of blood, with swooning and prostration." "A strong binder, fastened with loops and tapes, was applied after the birth of the child, and tightly drawn, and over these a tourniquet was passed round the pelvis, with a flat book, as a pad to equalize the pressure, and drawn moderately tight. A number of napkins being provided, were forced, with the open hand, one by one, under the binder. On the hæmorrhage occurring, the screw, which had been reserved as a *dernier ressort*, was employed, and the bleeding was completely arrested. This lady recovered without anything untoward, and declared that it was the best confinement that she ever had." She had had several children, and was "always on the point of death from excessive flooding, after every delivery."—*Med. Times and Gaz.*, Nov. 3, 1855, p. 455.

two or three hours, that the circulation may be quite restored and nervous irritation removed.* Sleep, unquestionably, is the greatest safeguard against the return of the hæmorrhage. It cannot, however, be always fully relied on. I have known it recur after an hour's tranquil sleep, during which time the hæmorrhage had thoroughly ceased, and the uterus was well contracted. It is especially, too, likely to happen if the patient have been suddenly awake; but without this, a quickened pulse and hæmorrhage will occasionally ensue.

When flooding has ceased, and the uterus is contracted, the retaining it in this state is an important object. Should hæmorrhage occur after the accoucheur has left the house, the patient herself or the nurse can easily tighten the compress, and arrest the discharge until his arrival. To avoid the great fatigue of supporting the uterus for many hours, where tonic contraction cannot be secured, is of some value. I knew of a case that occurred in the practice of one of our first accoucheurs, in which pressure by the hands was kept up with the aid of an assistant for eighteen hours. When the uterus has been left perfectly contracted, it is quite common for some internal hæmorrhage to occur,

* Page 361.

to be followed by after-pains and the expulsion of coagula without farther evil consequences. Often, too, the accoucheur finds on his next visit that a more free discharge occurred after he left the house than he had anticipated. The patient, as Dr. Rigby truly states, is *never* safe from the occurrence or recurrence of hæmorrhage for several hours after delivery. We never know which case may be the exceptional one; it is well then to be always prepared, if we can be so without inconvenience. In country practice, the doctor may live several miles off; it is then most desirable to have a means of arresting hæmorrhage, should it happen, that can easily be used: the compress would enable him to leave his patient earlier and with greater confidence than he possibly could do without it. Although the bandage ordinarily is of great use in keeping the uterus in a contracted state, it cannot be relied on; and when the uterus continues to contract and relax for several hours after delivery, its inefficiency for preventing this is evident. Under such circumstances, Dr. Lee uses folded napkins under the bandage, and additional pressure by the hands of an assistant. He places the chief reliance in such cases on constant and powerful pressure over the uterus, and the application of water to the external

parts, and the exhibition of stimulants. The compress affords this constant and powerful pressure more easily and efficiently, and the assistant can be dispensed with. It is, too, impossible to regulate well for any length of time the pressure of the hands; the muscles unconsciously relax, the pressure is diminished, and then suddenly increased by the renewed efforts of the party.

The portability of the compress removes any objection that might be raised against it on this head. It ordinarily affords comfort to the patient; it is perfectly safe in its application; the pressure of it is equable, and can easily be regulated; it facilitates the expulsion of the placenta, and may prevent after-pains from clots. It is useful in the prevention as well as the suppression of post-partum hæmorrhage, and in an atonic state of the uterus will arrest the discharge until contraction can be effected; and when effected will retain it in this state. Probably uterine hæmorrhage has been considered as differing too much from other hæmorrhages; contraction of the uterus has alone been looked to, and the efforts to effect this sometimes fail in their results. The great value of efficient pressure has not—from too exclusive views held with regard to post-partum hæmor-

rhage—been sufficiently appreciated. Were the treatment of flooding more successful, more easy of application, and were fewer evils to ensue when life has been barely saved—saved, perhaps, frequently as much by nature's efforts as the accoucheur's—it would be unnecessary to seek for further aid; unfortunately, however, results prove the contrary.

APPENDIX I.

MR. W. B. ROOFF, of 8, Willow-walk, Kentish-town, has, at my request, made new valves to Dr. Murphy's Chloroform Inhaler, which act more efficiently, and do not become deranged, as I have found the Indian-rubber ones do from the chloroform vapour acting upon them, and causing them to curl up. This alteration greatly improves the instrument.

APPENDIX II.

(From the *Lancet*, Dec. 13, 1856.)

ON THE MODE OF USING CHLOROFORM IN MIDWIFERY,

WITH THE DESCRIPTION OF A NEW INHALER
FOR ITS ADMINISTRATION.

ACCOCHEURS who approve of the use of chloroform in labour adopt different methods in administering it, and there can be but little doubt that too commonly more chloroform is inhaled than is needed to lull the pains. One accoucheur has stated, that in his practice he allows the patient to hold the inhaler, and when she has received sufficient the hand drops, and so the inhaler is withdrawn. Voluntary motion ought not to be interfered with by chloroform in ordinary labour, and it is of consequence, when chloroform may be administered for a considerable time, to insure its safety by only affecting the cerebro-spinal system to the extent of subduing the pains. It is, too, important not to unnecessarily relax the muscular system, for what induces this would favour the occurrence of hæmorrhage, and, which I have elsewhere mentioned, I

believe to be the only feasible objection to its employment.*

Applying it on a handkerchief is most objectionable, as the quantity to be inhaled cannot be properly regulated, when it is desired to be given in the first degree, only to stop sensation without removing consciousness. The position, also, of the patient is not favourable for its being thus inhaled, and there is every probability of excoriating the mouth with the chloroform. It is, too, a most troublesome and fatiguing way of using it, as well as a most wasteful one; for an additional quantity would be required for each pain, and the air of the chamber becomes unnecessarily and injuriously impregnated with the vapour, which frequently will prove most disagreeable to the accoucheur, by causing drowsiness or headache. Moreover, this mode of administration precludes his being able to attend properly to the delivery.

If, then, an inhaler be determined on, the difficulty arises of procuring one portable and adapted for the purpose. Dr. Snow's is bulky and inconvenient for ordinary midwifery practice, although most suitable when the full effects of chloroform have to be developed. I agree with Dr. Murphy in

* Aids During Labour, p. 35.

preferring “an inhaler that is applied only to the mouth, as the safest mode of administering chloroform that can be adopted :” * not that I think with him that the vapour of chloroform entering by the mouth is necessarily diluted by *double* the quantity of air entering through the nostrils, and *precedes* it into the lungs, and thus “shields the cells from its too-powerful influence.” † Should respiration be carried on simultaneously by the nostrils and mouth, I demur to the asserted proportions of air passing through each ; and even were they reversed, I believe that one half for the nostrils would be too great an allowance, and, which I have elsewhere stated, that I should guess at about one-fifth of the whole inspired. I also do not admit that the air from the nostrils *precedes* that from the mouth into the lungs. If diffusion do not occur, I believe the reverse to be the case ; consequently I do not advocate an oral inhaler upon these premises, but rather upon the gradual and small amount of vapour evolved, and consequently inhaled, and which is necessarily greatly diluted with atmospheric air. One fact I have ascertained—viz., that when the chloroform is eagerly inhaled, and the patient gasps at the inhaler—as she will commonly do in her anxiety to obtain

* Chloroform in Childbirth, p. 31.

† Op. cit. p. 83.

relief from pain—respiration is wholly performed by the mouth. This is easily determined by placing a piece of glass or thin metal between the inhaler, when applied to the mouth, and the nostrils. If a piece of lighted paper be held in front and a little below the latter, and forcible respiration be made, no flickering of the flame will be produced, nor when extinguished and low combustion occurs, will any effect be produced on the column of smoke. I have, in my work, p. 83, remarked that when the patient gasps at the inhaler, the nostrils should not be taken into account, that the inhaler should be withdrawn, and the patient should be told that unless she inhale quietly she cannot be permitted to have the chloroform. Were it allowed under such circumstances, asthenia would be likely to ensue. The same is embodied in Rule V., p. 86.

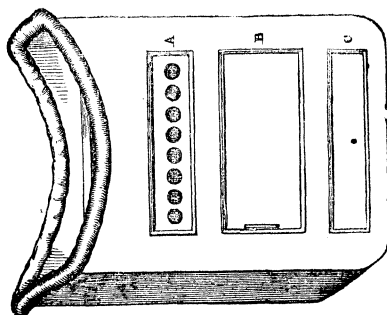
Dr. Murphy's inhaler does not answer in practice, as the Indian-rubber valves are acted upon by the vapour of chloroform, which causes them to curl up, and to become thoroughly useless. I have tried to correct this by having Mr. Rooff's valves attached to it. These act beautifully, and I thought would have answered all I desired. I found, however, that the construction of the inhaler was unsuitable for them. The expiratory valve is on the outside of the inhaler, and the inspiratory one

in the inside at the top of the chloroform chamber. The latter is necessarily dependent and open when not in use, and is only closed during expiration ; consequently at all other times the chloroform chamber is an open one, and there is nothing to prevent the vapour passing off. Mr. Roof tried to remedy this when he was attaching his valves to the inhaler Dr. Murphy used, and in which the Indian-rubber valves were found worthless, by fixing a semicircular plate outside the inhaler, which was made to slide off or over the valve as required. Having to do this, as well as to withdraw a cork stopper each time the inhaler is used, renders its application unnecessarily complicated, and most probably one or the other, after a few times, might escape attention in the hurry with which the inhaler has to be applied. I was thus induced to contrive one which I believe is free from all objections.

On examining the form of Dr. Murphy's inhaler, I found that it increased its size without any proportionate advantage. Thus the mouth-piece is wider than need be, and, from being funnel-shaped, is unnecessarily deep. At the end of this is attached the chloroform chamber, which is fully a third less in width than the mouth-piece, and sufficient capacity is obtained in length. The depth,

too, is considerably increased—by about a fourth—from valve cases above the chloroform chamber. I have diminished the width of the mouth-piece in my inhaler, and increased that of the chloroform chamber, so that the two correspond, which greatly simplifies the construction of the instrument, and reduces its length. This inhaler, with case and chloroform bottle, are no longer than Dr. Murphy's inhaler alone, whilst its width and depth are less. It will be seen also that the valves do not project. To obviate the defect of the inspiratory valve being open in the chloroform chamber, and allowing of the escape of the chloroform, the chloroform chamber is divided into two parts ; one, the main part of it, is for the sponge ; the other small portion is for the inspiratory valve, which is attached a little below the upper part of the inhaler on "a seating," and when not in use closes the chamber, and when in action the air is made to enter from the bottom instead of at the top, as in Dr. Murphy's inhaler. The expiratory valve rests on "its seating," which extends, too, to the sides of its chamber, which is situated between the mouth-piece and receptacle for the chloroform, and is always closed when not in action. The valves are twice as large as in Dr. Murphy's first inhaler, so as to allow of free ingress and egress of air. The

chamber is charged with chloroform by merely drawing out a slide on the top of it. When required for use, instead of having to withdraw a cork stopper, a slide exists at the base of the mouth-piece, which is easily opened, or closed, as necessary.



A. The expiratory valve, situated immediately beneath the black spots, which are openings for the exit of air.

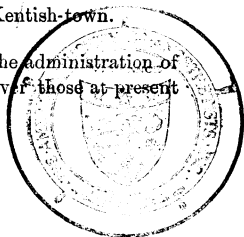
B. The slide of chloroform chamber.

C. The part corresponding to the situation of the inspiratory valve. The air enters from the inferior surface of the inhaler through an opening covered with wire gauze, corresponding in size with that for the expiratory valve.

The inhaler is a little more than three inches long and two and a quarter broad, and not quite one and a quarter deep. A bottle for chloroform fits into the mouth-piece. The case, complete, measures four inches three-quarters long, two inches five-eighths, and one and a half deep.

The inhaler is made by Mr. Rooff, of Kentish-town.

"Dr. Pretty's improved inhaler for the administration of chloroform possesses some advantages over those at present in use."—*Lancet*, Oct. 11, 1856, p. 422.



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