THE PULSE-RATE CONSIDERED IN RELATION TO POST-PARTUM HÆMORRHAGE.*

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It is not necessary to insist upon the great value which would be possessed by any trustworthy prognostic of post-partum hæmorrhage, or, when it has set in, of its probable result; and some conditions are recognised in which the accoucheur is taught by experience to apprehend, if not actually to expect, it. A primipara, for example, is always to be watched with solicitude in view of this kind of hæmorrhage, until she has proved herself to possess a uterus of good contractile power; and so also a very speedy, or a very tardy, labour are known to conduce to it. Yet, after all, it is the suddenness with which hæmorrhage sets in after the natural delivery of apparently healthy women which lends it its chief terrors; for in this case, pre-eminently, forewarned is forearmed.

There has been added to such prognostic circumstances as I have mentioned—I do not know by what writer in the first place—a prognostic derived from the state of the pulse, both as regards its *quality* and as regards its *rate*. As regards quality, Madame La Chapelle first remarked that such a pulse as indicates plethora obtaining during pregnancy and labour is likely to be followed by post-partum hæmorrhage; and Gooch was the first to describe such a pulse in this relation particularly, and to indicate the course to be pursued—either prophylactic, or preparatory to encountering the hæmorrhage itself, according to the period at which this peculiar kind of pulse was observed. Later than this, I believe, stress was first laid upon the rate of the pulse; and it has become an aphorism of obstetric practice, that, if after delivery the pulse range above a hundred beats in the minute, the patient cannot be considered safe. As a rule, it is taken that this means that the patient is not safe from hæmorrhage; but upon the authority of Dr. McLintock,†

* Read before the Harveian Society of London, January 17th, 1878.

† *Dublin Quarterly Journal*, 1874, p. 75 *et seq.*

Dr. Labatt (whose opinion the former holds in great esteem) enlarged this inference to include convulsions as well as hæmorrhage. Upon the authority of writers too numerous to mention, however, it may be asserted that this axiom is laid down with regard to hæmorrhage alone—constitutional disease or any other obvious cause of variation in the pulse-rate being of course excepted.

Now, if the pulse-rate do indeed carry the weight with which it is thus accredited, I think it is plain that in it we possess a prognostic of post-partum hæmorrhage of such simplicity that death should but seldom ensue upon a complication of labour which, nowadays at least, is seldom uncontrollable save when unexpected. But if it have not this value, the result of misplaced confidence in it must be estimated exactly in inverse proportion to its supposititious value ; for the converse of the aphorism is also asserted—as by Dr. Denham,* who says that even if a patient had free hæmorrhage, supposing her pulse to beat below a hundred, he would leave her with perfect confidence.

It does not seem likely that the statement first referred to—so valuable if true, so misleading if false or only partly true—should have been made upon any less ground than that afforded by precise observation. Yet I must admit that neither by inquiry nor by research have I discovered any record of observations bearing upon the subject of this paper, although many opinions may be found—the opinions of obstetricians whose names alone insure respectful consideration for them. I will therefore say at once, in case my observations or my conclusions from them should seem to contradict these opinions in any respect, that I desire not only that the conclusions should be distinctly separated from the observations, but that the latter—correct as I have endeavoured to make them and believe them to be—should be regarded as preliminary only to a future consideration of the subject. They are deficient in many respects ; but, apart from that, to make such observations accurate in a scientific sense is a matter of extreme difficulty.

* Loc. cit.

The objects to be sought, as it appears to me, are the behaviour of the pulse after normal delivery and the behaviour of the pulse after delivery complicated by hæmorrhage. In these tentative observations the cases utilised are sixty-three in number. They are not consecutive, since they were taken during two or three years; but they are not selected, each case being observed or not according as I happened to have watch, pencil, or writing material at hand. They include fifty-four cases of uncomplicated delivery, and nine cases of post-partum hæmorrhage. In every case the first observation was made as soon as the child was separated from the placenta, except as otherwise noted; and I estimate that time to be within three minutes of actual delivery. In every case also, every observation was made by the watch, the pulse being counted during not less than half a minute, and the result was written down at the time. Generally three observations besides the first were made, at short intervals extending over thirty minutes—for it is during the first half-hour from delivery, in the vast majority of cases, that hæmorrhage occurs: and usually a final observation was made at about twelve hours, although this is but seldom referred to.

The fifty-four observations of the pulse in cases of labour uncomplicated by hæmorrhage need not be recapitulated. It will be sufficient if I analyse them. They divide themselves into three classes, which consist of the majority, or thirty-nine, which agree in behaviour pretty closely; and of two kinds of exception to this prevailing rule, which are followed by six and by nine of the remaining fifteen cases respectively.

TABLE I.

In thirty-nine cases the pulse fell within thirty minutes after delivery.

From	130	to 120	From	108	to 84
„	126	„ 106	„	105	„ 80
„	120	„ 96	„	104	„ 96
„	120	„ 108	„	104	„ 75
„	120	„ 100	„	102	„ 84
„	118	„ 108	„	102	„ 92
„	115	„ 92	„	100	„ 84
„	111	„ 99	„	100	„ 86

From	98	to 69	From	88	„ 84
„	98	„ 88	„	88	„ 78
„	96	„ 84	„	86	„ 80
„	93	„ 78	„	86	„ 80
„	92	„ 80	„	84	„ 72
„	92	„ 84	„	84	„ 72
„	92	„ 86	„	84	„ 62
„	92	„ 84	„	84	„ 62
„	92	„ 84	„	80	„ 76
„	90	„ 78	„	76	„ 60
„	90	„ 82	„	76	„ 69
			„	69	„ 66

In the majority, or thirty-nine cases, the pulse fell within thirty minutes of delivery by an average number of 13½ beats; the extremes being 3 and 29. Very often the greatest fall occurred from the highest initial rates, as—

A fall of	20	occurred from a rate of		120
„	29	„	„	98
„	24	„	„	96
„	25	„	„	105
„	29	„	„	104

And very often the lesser falls occurred from the lowest initial rates. As

A fall of	4	occurred from a rate of		88
„	4	„	„	80
„	4	„	„	88
„	4	„	„	86

and so forth. So that at first sight it seems that these thirty-nine cases support the natural anticipation (formulated by Dr. Churchill*) that the pulse, quickened by the exertion of labour, tends to fall to the normal rate during repose. But there are several exceptions even to the cases which seem to support this expectation; as where

A fall of	16	occurred from a rate of		76
„	9	„	„	76
„	3	„	„	69

and it may be mentioned here, that falling of the pulse after uncomplicated labour to an abnormally low rate is a well-known, although not frequent, occurrence.

It therefore appears more correct to say simply, that after

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* Loc. cit.

labour the pulse falls by a few beats—without reference, that is to say, to the standard rate of 75, or thereabouts. But although, as these cases show, that is perfectly true of the majority, a consideration of the exceptions makes it apparent that this assertion is unsupported in fact. Of the remaining fifteen, in six the pulse remained absolutely steady at its initial rate; and this was 60, 72, 84, 64, 72, and 104, respectively; while in the remaining nine cases, which constitute the second kind of exception, a rise from the initial rate was observed.

TABLE II.

A rise of	10	occurred	from an initial rate of	76
,,	16	,,	,,	56
,,	4	,,	,,	86
,,	4	,,	,,	72
,,	6	,,	,,	96
,,	12	,,	,,	84
,,	5	,,	,,	63
,,	20	,,	,,	104
,,	10	,,	,,	54

That this rise is not merely the result of a natural tendency of the pulse to attain the standard rate is shown by the first, third, fifth, sixth, and seventh cases in this table; and it is to be observed, first, that this rise occurred very rapidly, and secondly, that it was maintained very steadily; maintained in the most marked instances during several hours short of twelve. In the last case but one the pulse still beat at 120 during the twelfth hour from delivery, although no complication to account for this high rate could then or subsequently be detected.

Thus it must be admitted, *upon such evidence as these fifty-four cases afford*, that the pulse may fall below, rise above, or remain steady at the rate obtaining immediately after delivery; and especially that it may rise to, fall to, or remain at, 100 or thereabouts, after delivery uncomplicated by hæmorrhage or by any other recognisable circumstance.

It remains to examine the behaviour of the pulse in cases of flooding; and it will be seen in inquiring into this point how far a low pulse-rate justifies the attendant in leaving his patient. The cases are nine in number; and as they are of various

degrees of severity I have classified them according to Dr. George Johnston's method. He gauges the severity of a case of flooding by the measures necessary to restrain the loss. Thus, cases in which pressure and cold externally are sufficient are placed in the first class ; the second comprises those in which the hand must be introduced into the uterus and cold water or ice passed in ; while the necessity for injecting the perchloride of iron distinguishes the third class. But as the correctness with which a case is placed in one or other of these classes depends upon the operator's judgment—in not using the perchloride, for example, except when that is absolutely necessary—I have to my short account of these cases appended a note of the amount of blood lost ; that is, the amount of that which could be gathered up in the hands and measured. In the first six cases this amount is estimated only by the double handful, which is equivalent to from two and a half to three ounces ; but in the three cases of the third class it was actually measured. The observations were taken precisely as in the normal cases, and, in every instance but one, the first observation was made before any hæmorrhage had occurred ; and, whether there were three observations or six taken, the last is that upon taking which I considered that the patient might be left. In no case was there any secondary loss.

I may now refer to the character of the pulse as distinguished from its rate, as observed in the whole number of sixty-three cases. I believe I have observed every kind of character among them except that described by Gooch ; and I have concluded that (with that exception) no information with regard to hæmorrhage can be derived from the character of the pulse. Yet I may remark here that Dr. Lombe Atthill* has pointed out that the pulse may be deranged in a manner agreeing closely enough with Gooch's description from two different causes, which are anæmia and plethora ; and that he is of an opinion, with which I venture to agree, that the quick full pulse which is due to plethora is not in-

* Loc. cit.

TABLE III.

A Table of the Pulse-rate in nine cases of Post-partum Inertia Uteri.

No.	Class of Hæmor.	Description of Labour.	Pulse-rates at minutes after delivery, &c.							Amount lost.	Remedies employed.	Result.
1	1st.	2nd. 1st stage 26h. 2nd ,, 4h.	8 m. Placenta removed.	10 m. Hæmor. began. 102	12 m. Hæmor. continued. 108	18 m. Hæmor. continued. 108	25 m. Hæmor. ceased. 108	Pulse continued steady at 108		About 20 ounces.	External cold and pressure.	Did well.
2	,,	2nd. 6 hours.	3 m. 60	8 m. P. removed.	10 m. Hæmor. began. 60	15 m. Hæmor. continued. 60	20 m, Hæmor. diminished. 60	25 m. Hæmor. ceased. 60	Pulse continued steady at 60	About 20 ounces.	The same.	Did well.
3	,,	3rd. 15 hours. Ergot and forceps.	5 m. Hæm. began. P. removed. 132	15 m. Hæmor. continued. 120	20 m. Hæmor. diminished. 100	30 m. Hæmor. ceased. 80				About 30 ounces.	The same, with brandy and ergot.	Did well.
4	2nd.	Pr. æt. 25. 12 hours. Forceps for exhaustion.	5 m. Ran up from 100 to 130. P. removed with clot.	10 m. Hæmor. continued. 140	20 m. Hæmor. continued. 150	40 m. Hæmor. diminished. 140	90 m. Hæmor. ceased. 120	12 hours irregular. 126		About 35 ounces.	The same, with ice internally. Prepared to use perchloride.	Did well.
5	,,	2nd. Born before arrival.	5 m. Hæmor. already considerable. 70	10 m. Hæmor. continued. 70	15 m. Hæmor. continued. 70	20 m. Hæmor. diminished. 70	30 m. Hæmor. ceased. 70	Remained steady at 70		About 35 ounces.	Ice internally. Laudanum, brandy, and ergot.	Did well.
6	,,	Pr. æt. 22. 6 hours.	5 m. P. removed with clot. 76	10 m. Hæmor. continued. 74	15 m. Hæmor. continued 76	20 m. Hæmor. continued. 76	40 m. Hæmor. diminished. 64	50 m. Hæmor. ceased. 62	24 hours. 72	About 40 ounces.	As above?	Did well.
7	3rd.	Pr. æt. 21. 12 hours.	5 m. 72	10 m. P. removed with clot. 96	30 m. Hæmor. continued. 106	45 m. Hæmor. continued. 96	50 m. Fainted. Hæm. contd. 96	55 m. Perchloride injected.	65 m. Hæmor. ceased. 108	60 ounces by measure.	As above. Perchloride of iron injected.	Did well.
8	,,	Pr. æt. 24. 9 hours. Forceps.	Before delivery 10 m. 120	7 m. P. removed with clot. 126	12 m. Hæmor. continued. 130	20 m. Hæmor. continued. 128	40 m. Perchloride injected. 130	75 m. Patient left. 126		80 ounces by measure.	The same.	Did well.
9	,,	9th. 48 hours. Conj. diam. 3⅜ in.	6 m. P. removed with clot.	7 m. Hæmor. continued.	10 m. Hæmor. continued. 118	15 m. Hæmor. continued. 118	20 m. Hæmor. continued. 128	30 m. Hæmor. continued. 120	50 m. Perchl. inject. 60 m. Hæm. ceased. 104	65 ounces by measure.	The same. Sclerotic acid subcutaneously. Perchloride injected.	Did well.

variably followed by, and therefore does not prognosticate, the occurrence of hæmorrhage. It may be that such a pulse occurred among some of the uncomplicated cases, but that for this reason I did not notice it particularly. In two of the uncomplicated cases I observed intermittence of every fifth beat; I was unable to account for it. It persisted for twelve hours, but had disappeared by the thirty-sixth. I observed irregularity of the pulse in thirty cases out of the whole number; and I have satisfied myself by repeated observations that irregularity of the pulse is far more frequent after delivery than regularity. It usually persists for some hours short of twelve, by which time it has generally disappeared. It is to be noted that irregularity occurred in only one of the cases of hæmorrhage; and since the numbers in the table of these cases appear to indicate a degree of irregularity in more than one of them, I will explain that by that term I intend such irregularity as is observed in cases of brain disease, for instance. That is, that two observations made during two periods of five seconds may give different results, but that two observations made during two periods of a minute each will give the same result. This differs—whether or not essentially—from the irregularity of a pulse which now beats at 60, in ten minutes at 120, and in ten minutes more at 100, and then again at 115. I have observed no such irregularity as that in either kind of cases. The irregularity to which I now refer has no significance whatever with regard to hæmorrhage, and I have not discovered its connexion with any definite condition. It is less common in those who are obviously exhausted by their exertions than in those who do not seem to have suffered particularly.

If we now refer again to the table, and scan the register of pulse-rates in the cases of hæmorrhage, I think the first remark which offers itself is that a low or even a very low rate is consistent with a degree of hæmorrhage necessitating careful attention and energetic treatment to arrest it. One case of the first degree of hæmorrhage shows a perfectly steady rate of 60, two of the second degree a steady and a

nearly steady rate of 70 and 76 respectively; while one of the third degree, in which so much as sixty measured ounces were lost within thirty minutes, shows a rate which at the majority of observations was 96, and which at no time rose above 108. It will next be noticed that the only case in this list in which a really high rate obtained—that in which the pulse stood at 130 at delivery, rose to 150, and after all fell no lower than 120—is a case of hæmorrhage of the second degree only. So that it may be said to be obvious at a glance, that no very close relation is shown by this table to exist between the pulse-rate and the *degree* of hæmorrhage at all events. Upon this the reflection occurs that what is conveniently known as post-partum hæmorrhage is, in fact, relaxation of the uterus; and it may well be asked whether the causes of uterine inertia be always such as are likely to affect other parts of the system—the circulation, most especially?

Here I must beg your attention for a moment while I point out that in thus confining my observations to relaxation of the uterus—or, to use a negative term in preference, uterine inertia—I do not overlook the fact that other conditions have been enumerated by Dr. McLintock and others as causes of post-partum hæmorrhage. The causes of this complication are, he says, relaxation of the uterus, a plethoric state of the circulation, and deficient coagulability of the blood. But relaxation, or inertia, is the essential condition of hæmorrhage of this kind—without it hæmorrhage cannot occur. Be there never so much plethora, never so slight a tendency to coagulation of the blood, no loss can flow from a perfectly contracted uterus, obviously. I therefore venture to demur to this classification of causes of hæmorrhage, which places an essential condition upon the same footing as accidental circumstances, and prefer to concern myself with the former alone. Were one or other of these two additional circumstances of hæmorrhage ascertained to be invariably associated with uterine inertia, the assumption would be that they are respectively indications of systemic conditions of which the said inertia is a result.

But the contrary is the case; they are known to be occasional concomitants of inertia merely: and, indeed, while Dr. McLintock himself is not inclined to lay much stress upon deficient coagulability as a cause of hæmorrhage, it is not known that plethoric women suffer especially from post-partum inertia of the uterus. Nevertheless, it may be admitted that either of these conditions might aggravate the amount of blood lost within a given space of time; but I do not know that the author cited has regarded them in this light.

I feel justified therefore in basing such remarks as I may make upon the observations before you, upon the hypothesis that if the circulation afford an indication of the future state of the uterus with regard to the efficiency of its contractile power, then inertia must be the result of systemic disturbances. What is the probability? To speculate upon this question in the present state of knowledge of the nerve supply of the uterus would, I believe, be unprofitable. It is certain, however, that this organ is possessed of powers of action which are independent of the cerebro-spinal nerve system, and which are derived from the ganglionic system. While therefore it might fairly be surmised that a condition of the nerves which control the uterus tending to its imperfect contraction, which should be confined to the uterus, and should not betray itself by any systemic aberration, might exist; yet it could not be denied that such a derangement, although chiefly manifested by a local effect, would probably be only a part of a general disturbance of the system likely to be attended by other functional derangement—of the circulation, for example.

This, it seems to me, is a subject for physiological inquiry. Yet, as a matter of practical experience, we know that uterine inertia occurs under a variety of circumstances in which it is not only impossible to distinguish any other condition common to all, but very often impossible to distinguish any other derangement whatever. It is quite true that a prolonged labour, which exhausts the system as well as the uterus, is often followed by hæmorrhage. But it is equally certain that

an extreme degree of systemic exhaustion is consistent with active contraction of the uterus, on the one hand; on the other, that apparently perfect freshness of the body is consistent with a marked degree of uterine inertia. So, also, we know that while repeated but futile efforts of the uterus predispose to post-partum inertia, a few efforts leading to precipitate delivery is at least an equally efficient predisposing cause. Lastly, not to multiply examples of a fact with which every one is familiar, there is a class of women for whom the term "flooder" has been invented; to whom it is justly applied, because the reason of their flooding is occult. Be these persons favoured never so much by nature and by art in their labour, as soon as they are delivered they "flood." Farther, such women as have flooded without obvious cause in several labours, will on another occasion fail to flood; and this behaviour appears to be as erratic as the former. I shall immediately relate such a case as this. In short, we know practically that the condition of the uterus after delivery is not invariably dependent upon any general condition of the body hitherto recognised; that the uterus may refuse to contract while the system is entirely unaffected; that the system may be utterly exhausted, the uterus not at all. Now, upon the evidence offered by the sixty-four observations before you, it may be observed that while the state of the uterus in the two classes of cases is respectively uniform, the pulse-rates in each class are various. I suspect therefore that, *quâ* the uterus the state of the pulse is accidental; but that *quâ* the system the pulse-rate is the direct result of disturbances which do not necessarily affect the uterus, although they may sometimes be such as to do so.

If this opinion be entertained, those variations of pulse-rate in the different cases in each class which would appear anomalous call for no especial remark. It is necessary only to point out briefly in what way these cases show that post-partum hæmorrhage is usually the result of conditions which, whatever they may be, do not affect the pulse. I will first of all recall that instance among the normal cases in which I observed the pulse to stand at 104 at delivery, and

to maintain that rate steadily during about twelve hours. This was the patient's third labour at term. Her first appears as Case 7 in the table of cases of hæmorrhage, and it appears that she then had a pulse-rate of very near a hundred, above or below; I now add that no reason for her flooding could then be recognised, either in her constitutional condition or in the kind of labour she suffered. In her second confinement I did not attend her, but upon that occasion she was reported to me as having flooded to a dangerous extent, and again no reason for the hæmorrhage could be assigned. On the present occasion she was delivered after a labour of six or seven hours, the child being born at last before I could get back to the house. Knowing her previous history, I was somewhat alarmed at this, and hastened to the bedside; and then, although I ascertained at once that there had as yet been no hæmorrhage, I could gather no assurance from the pulse-rate (if that were to be taken as an indication of approaching hæmorrhage), for it stood at 104. But the uterus remained well contracted, and spontaneously expelled the placenta without a drop of blood, and yet the pulse still beat at 104. I waited a long time in order to watch it, but it still maintained itself at that rate, and was still found to beat at it many hours after delivery; although no discharge occurred from the uterus for several hours, and no complication of any kind could then or subsequently be ascertained to account for it. That, I think, is for my present purpose a very valuable case; for, if Table III. be referred to, it will be seen that the pulse-rate observed during her first flooding never rose above 108—a rate practically the same as that which obtained upon the last occasion, when she did not flood. So that it seems that in this case, at all events, the action of the uterus and the pulse-rate were independent of each other.

I ask your attention next to Cases 3 and 4, in Table III.—cases of the first and second degrees of hæmorrhage respectively, but which show the highest pulse-rates of all. In both, although it is noted only in the second, a very marked degree of systemic exhaustion was observed; and in these cases it

is, I think, evident that the pulse-rate bears a very close relation to the hæmorrhage, which, it is equally apparent, was the result of no special uterine inertia, but of the general exhaustion of the bodily powers. At delivery, in Case 3, the pulse stood at 130, and sank steadily to 80 during the first half-hour; as the patient recovered herself the pulse sank, and the hæmorrhage ceased. In Case 4, during the exhaustion immediately following delivery the pulse suddenly ran up to 130, and then during twenty minutes gradually touched 150, subsequently falling to 126. Here, too, while the pulse was rising the patient remained exhausted, and the inertia persisted; but the fall in the pulse-rate advanced *pari passu* with the general recovery and contraction of the uterus. In these cases, then, we have two examples of inertia, possibly owing to a systemic condition, and we see that in such cases the pulse behaves in a particularly marked manner. But I think that it needs scarcely to be pointed out that they afford no evidence of an association between the pulse-rate and the *degree* of inertia, but only that conditions may obtain under which both circulation and uterus are simultaneously affected. It is even too much to say that when a great degree of systemic depression coincides with a very high pulse-rate, hæmorrhage is to be apprehended; for shock produces precisely the same effect of steady rise and fall in the pulse-rate, even when, as in these two cases themselves, there is no considerable persistence of the uterine inertia. Thus in a primipara who laboured during an average period, and in whom the head emerged without injury to the perineum, but, the body being suddenly shot out by a pain of extraordinary violence the shoulders caused a very severe laceration, there immediately arose symptoms of shock. There was no fainting, no intellectual confusion, nor any complaint; only pallor and extreme depression. During an hour and a half the loss amounted to ten measured ounces only; but the pulse, which stood at 120 at delivery, rose to 136, and then, as recovery set in, gradually sank from 136 to 124, 112, and 90, when recovery appeared perfect. So in a case recently laid before you, in which death

occurred from shock, probably due to laceration of the uterus, the pulse-rates at short intervals after delivery were 120, 120, 130, 140, 150 to 160; at which point the pulse stood for an hour and a half or thereabouts, when death occurred. The total loss in this case was forty measured ounces only—not a large quantity—and was checked within a few minutes of delivery by the perchloride of iron. That the pulse-rate followed the peculiarly marked course already indicated was due, not to a special condition tending to inertia, but to a general condition which included the latter. Thirdly, in a case of concealed accidental hæmorrhage, in which it may fairly be said that the danger to life arises in the shock or depression of the vital powers rather than in the hæmorrhage, the pulse before delivery but after the beginning of shock stood at 120; immediately after delivery at 120, and very soon after that (when the degree of depression is always much increased) it rose to 126. Twenty-five minutes afterwards it fell to 112, and continued to fall as recovery progressed thus—108, 80, 78, 72. In this case almost all the hæmorrhage had occurred before delivery; was independent, therefore, of inertia; all the danger lay in the degree of shock, and the pulse, as in the other two cases, followed the systemic condition of the patient very closely.

This is a state of the circulation under certain conditions, which I believe has not yet been pointed out. I refer to it now in order to show that in the only known case in which the pulse is affected in a characteristic manner, a marked systemic condition coincides; and as farther evidence that this peculiar behaviour of the pulse is not connected in any direct manner with the state of the uterus, I remind you that in none of these five instances of highest pulse-rates was the inertia persistent—in none, that is, was the hæmorrhage excessive or uncontrollable. The table of cases, indeed, offers only three cases in which there was real danger to life—a number too small, certainly, to base any conclusion upon. But, since the condition with which I am concerned—inertia—was present in all nine cases, differing in those cases only in persistence; and since, if the third and

fourth cases be excepted, no disturbing element could be recognised in any of them, the rates shown by the remaining seven should agree with each other pretty closely, and the rates in each class more closely still. They do not, however, appear to follow any definite rule.

Lastly, upon this occasion I wish to point out that these notes show that in fact I have disregarded the pulse-rate as a prognostic, or indication of my patient's safety from hæmorrhage. In several cases I have, as may be seen from the various tables, left them with a pulse-rate high above 100; and I may now affirm that I have done so with perfect confidence. Herein is confirmation, of a kind, of my contention. Others, no doubt, consciously or not, act so too. In practice, one prefers to ascertain the condition of the uterus directly, rather than to draw an inference regarding it from signs liable to variation from so many causes as are those afforded by the state of the circulation.

Here I must for the present relinquish this tentative or preliminary inquiry, which, as ancillary to that into the causes of post-partum inertia, is of great interest, and likely to afford practically useful information. In the meantime, I believe that these notes justify a contradiction of the bare assertion that a pulse which beats at or about a hundred shortly after labour prognosticates inertia of the uterus; while they establish the observation that when uterine inertia results from the systemic condition of shock, the pulse not only behaves in a peculiarly marked manner, but that from its behaviour a prognostication may be made. Not a prognostication, however, of the state of the uterus as such; but of a state of the patient which sometimes affects the uterus.