

ON THE CONTRACTIONS OF THE UTERUS
THROUGHOUT PREGNANCY: THEIR PHYSIO-
LOGICAL EFFECTS AND THEIR VALUE IN THE
DIAGNOSIS OF PREGNANCY.

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I AM anxious to direct the attention of the profession to a point connected with the pregnant uterus, which has been almost entirely and surprisingly overlooked, as far as my researches into authors lead me to believe. Perhaps the following quotation from Dr. Tanner's work 'On the Signs and Diseases of Pregnancy,' p. 118, 1860, will best show the state of our knowledge and the authors who have alluded to the subject:

"More than twenty years since Mr. Ingleby observed that 'in advanced pregnancy the uterus, when moderately grasped and rubbed, slightly hardens and almost instantly regains its yielding condition.' Dr. Oldham has since pointed out that this power of contraction possessed by the uterus may be taken as a trustworthy characteristic of pregnancy; for he states that the large gravid uterus alters in a marked manner, under the influence of pressure, from a state of flaccidity to one of tension. Thus, if we expose a pregnant woman, the outline of the tumour is seen to be less defined before manual examination than it becomes afterwards; for on applying the hand, the tumour which at first is felt soft and ill-circumscribed, rapidly assumes a tense rounded form, becoming firm and resisting. According to Dr. Oldham no other tumour but the pregnant uterus possesses the power of altering its form when irritated by palpation; but I must here beg to differ in opinion from this gentleman. Only a short time since I was examining the abdomen of a poor woman suffer-

ing from an attack of flooding, caused by the presence of a very large polypus in the uterus. The loss of blood had been very great, so that all the tissues were relaxed and flabby; and on placing my hands—which were very cold—over the tumour, I distinctly felt an increased rigidity of the walls of the uterus. The truth, indeed, appears to me to be this—that the uterus, in common with other hollow viscera, has, when enlarged through the presence of any substance in its cavity, a regular peristaltic movement consisting in slight contractions and dilatations. Under the influence of the former the outline of the organ can be easily appreciated, other conditions being favorable, and these contractions are undoubtedly the more evident the greater the size of the womb, and the more it is irritated by external manipulation. But as it seems that the peristaltic motions occur whenever the uterine cavity becomes enlarged from any cause, it necessarily appears objectionable to instance such movements as a trustworthy sign of pregnancy.”

To these remarks of Dr. Tanner's I may add a remark of Dr. Montgomery's in his work 'On the Signs of Pregnancy,' p. 100. He says:—"The uterus within the first four months has a feel of a soft, though pretty firm, fleshy tumour, not sensitive when pressed, of a uniform smooth surface, and of such a size as would be without difficulty grasped in the hollow of the hand. After this period, that is, from the fifth month, it loses somewhat of its firmness and distinct feel, owing to the greater expansion and consequent lengthening out of its fibres, which continuing to increase as pregnancy advances towards its termination, the circumscribed organ becomes less and less distinguishable; though generally to be detected by making pressure with one hand while we examine with the other, in doing which we also ascertain some degree of obscure fluctuation, but in the same proportion as the parietes of the organ become indistinct, its solid contents are more easily felt, and even separate limbs may be recognised and traced; the firmness of the tumour as well as the degree of fluctuation which it affords will very much depend on the size it has acquired or the natural firmness or supple-

ness of its structure, and on the quantity of liquor amnii. Owing to the variation in these causes a corresponding degree of difference will be recognised in its consistence in different instances, so that, while in some persons it is so soft and yielding as hardly to be felt, in others it presents a degree of solidity amounting to absolute hardness, though still healthy, and retaining its round or oval form and its uniform smooth surface."

Dr. Priestley* remarks only thus far, p. 83 :—"There can be no doubt, I believe, that it possesses contractile properties (before impregnation), as it expels blood-clots, dysmenorrhœal membranes, and intra-uterine polypi. During the extrusion of these we may sometimes distinctly recognise the alternate hardening and relaxation of the organ by placing the hand over the hypogastric region. Its muscularity at the full term of pregnancy scarcely admits of room for controversy." He then instances the pressure felt on your hand during a pain, &c. He thus passes over the contractility during pregnancy.

It is evident that Dr. Montgomery did not recognise intermittent contractile power in the uterus, but thought the difference he had noticed was owing to an inherent difference in the tonicity of the tissues in different persons. It does not appear how far Dr. Tanner's opinion as to the peristaltic movements was based on facts observed by himself in the different stages of pregnancy, because he gives no further information on this point, or whether his opinion was formed by a consideration of the analogy which the uterus distended bears to other hollow contractile organs.

Dr. Tyler Smith is much more clear regarding the contractions of the uterus, and foreshadowed in a measure the substance of this paper; but the contractions he instances are those which are caused by excitation, as the context shows. In discussing the position of the fœtus in utero he considers that the peristaltic action of the uterus has as much influence as the movements of the fœtus itself on its position. These movements he attributes to reflex irritation, derived from various causes of excitation. He believes very strongly in

* 'Lectures on the Development of Gravid Uterus,' 1860.

these movements as being of even greater frequency than the movements of the fœtus within it. Thus: "I have no doubt of the frequent movements of the fœtus in utero, but wish to insist upon the equal or even still greater frequency of the movements of the uterus itself."

Again: "With this change of shape the uterus acquires more power of muscular contraction, and becomes the subject of reflex and peristaltic movements."*

These passages from Dr. Tyler Smith's thoughtful work on 'Midwifery' show that he had a very clear perception of the movements of the uterus, but I gather from them that he looked upon them as being excited by various accidental causes of a reflex kind, which he enumerates at p. 197. It may be that the frequent and almost regular movements I shall describe are really due to reflex action, but they are best observed in complete passiveness of the woman. It may be that the semi-stagnant state of the blood in the uterine sinuses, &c., may provoke contraction, but certainly there is some other excitor than either the fœtal movements or the irritation of the various nerves in sympathetic communication with the uterus. These remarks of Dr. Tyler Smith were made two years before the appearance of Dr. Tanner's, but probably they had not arrested his attention. In any case subsequent authors are silent on the subject so far as I can find, both at home and abroad.

It was a source of difficulty to the older obstetricians to explain how that, at a certain time, namely, at the full period of pregnancy, the uterus, passive up till then, began all at once to acquire a new power, that of contracting; forgetful that, long before the full period had arrived, the uterus has the power to expel the fœtus, and under mental excitement or local stimulation, attempted to do so frequently.

But after many years' constant observation, I have ascertained it to be a fact that the uterus possesses the power and habit of spontaneously contracting and relaxing from a very early period of pregnancy, as early, indeed, as it is possible

* 'Manual of Midwifery,' p. 217, 1858.

to recognise the difference of consistence—that is, from about the third month.

When the uterus is normally placed it is, of course, difficult to make it out till a little after that time, but in the case of retroversion accompanying pregnancy, then the fundus being readily felt per vaginam, the contractions can without any difficulty be perceived.

Up to the end of the second month the walls are still dense, but after this time the fundus, as can be noticed if the uterus be retroverted, will begin to be elastic, and variation in its consistence is recognisable as the end of the third month is approached.

If, then, the uterus be examined without friction or any pressure beyond that necessary for full contact of the hand continuously over a period of from five to twenty minutes, it will be noticed to become firm if relaxed at first, and more or less flaccid if it be firm at first. It is seldom that so long an interval occurs as that of twenty minutes; most frequently it occurs every five or ten minutes, sometimes even twice in five minutes. However, in some cases I have found only one contraction in thirty minutes. The duration of each contraction is generally not long, ordinarily it lasts from two to five minutes. When the uterus is irritable or has been irritated it lasts longer than this; under particular circumstances, to be alluded to again, it may assume an almost continuous action analogous to that which is noticed after long obstructed labour.

Supposing, then, we commence our examination when the uterus is contracted, we find the organ firm and solid, somewhat like the uterus affected by a fibrous tumour. Gradually this state alters, the walls becoming softer and ultimately so flaccid that their outline can be hardly made out, unless the other hand be placed on the os uteri per vaginam, and even then sometimes with difficulty. So also, if we commence our examination when the uterus is in its flaccid state, it will at first be very ill-defined, so that, if we are careless or too rapid, we might readily say that there was no pregnancy; but shortly the shape of the organ gradually becomes more and more distinct, till we have

no doubt but that we have an enlargement of the uterus to deal with; after a time the firmness abates, and gradually the original condition of relaxation is complete.

If we more carefully investigate the uterus after the fourth month of pregnancy we shall further notice the phenomenon, which has been well described by authors, that during the period of relaxation the fœtus (if one be there) is generally to be detected by external palpation or by external ballotment. By internal ballotment also, in consequence of the increased impressibility of the uterine wall, we can make out the fœtal presence, its contour, often its movements, and its capability of being moved. But it is interesting also to notice, during the gradual increase of solidity, how the presence of the fœtus, quite distinct before, slowly becomes more indistinct, whilst the outline of the uterus becomes more clearly marked, till instead of the fœtus we find a hard globular swelling, which we could at the time we recognised the fœtus, scarcely, if at all, feel. That this phenomenon extends from the early period I have already mentioned, to the time of labour, is a fact to which I have never seen but one exception during a course of observations extending over about eight years; and this apparent single exception might have been none at all had a more prolonged examination been carried out at a time. It occurred in a case of paraplegia. Although she was under my care some time, and was subjected to frequent examination, yet the uterus was never found to contract. She went out of the hospital before labour arrived, but the labour was natural.

The constancy with which these contractions of the uterus have always occurred to me leaves no doubt on my mind but that it is a natural condition of pregnancy irrespective of external irritation.

In a general way the pregnant woman is not conscious of these contractions of the uterus, but sometimes she will remark that she has a tumour in her lower abdomen, thinking it a constant thing; but another will observe that she has a swelling sometimes, but which vanishes at other times. But occasionally it happens that the uterus is more than usually

sensitive, and that the contractions are accompanied by pain ; and then on examination it is found that each pain she complains of is coincident with a contraction.

Again, when the uterus has been excited by any cause, and these contractions are more than usually powerful, the woman is conscious of their presence, and by watching these we shall convince ourselves that the contractions, which were before unnoticed by her, are really the same as the so-called "pains" of premature expulsion of the fœtus and also of true labour.

Sometimes I have found the contractions last a considerable time, longer often than the intervals ; and this is more frequently the case if the uterus contain a diseased ovum, and particularly a solid or carneous mole ; but in general the contraction from its commencement to final recession lasts about five minutes. The duration both of contraction and interval varies very considerably.

But it is not only in healthy pregnancy that this phenomenon exists ; it is well marked, as just mentioned, where the fœtus is dead ; it is also to be found where the fœtus is absent, as in the case of hydatiniform degeneration of the chorion (vesicular mole).

How far this action is the same as the peristaltic or vermicular movement observed in the lower animals one can hardly say, but one can hardly doubt a close analogy to it if not identity with it. But when excited into a more vigorous state there can be no doubt but they are of the same character and identical with "labour pains." And this serves to explain how it is that at a short notice we can bring on labour, and how it is that the uterus shall respond in a few hours (I have seen labour artificially induced accomplished without any traction in two hours) so as to expel the fœtus at the sixth month as well as it does at the ninth month.

By our manipulation we simply exaggerate the action already going on to such an extent that the natural process exhibited by the uterus at labour at full term continues till the fœtus is expelled. In other words, we supply that stimulus which nature herself supplies at the beginning of

labour at full term. The rest of the process is precisely similar. We need not, with the cognizance of this intermittent action, any longer wonder how it is that suddenly a new function is given to the uterus at the end of the ninth month; it is already in active exercise, not perceptible to the pregnant woman, though it is to the examining hand. We also find in this frequent contraction an explanation of the change of note in the uterine souffle. Every one conversant with the sounds of pregnancy has noticed how that while listening to the sounds formerly called *placental*, but now acknowledged to be uterine, the loud sonorous sound has become gradually higher till it is almost a shrill piping musical one. It has puzzled many authors to explain this, but one sees no difficulty in it; the diameters of the uterine sinuses are slowly reduced by the contraction of the walls, the rapidity of the rush of the blood increased, and the pitch of the sound consequently heightened. It also explains the phenomenon of "after pains," in which we see a continuation of the same intermittent movements after the removal of the exciting cause. It is probable that the enlarged state of the cavity after labour allows the exhibition of the action, and the uterus being more sensitive than before labour sets in, the contractions are more productive of pain than during pregnancy. As the cavity becomes smaller, and the walls relatively thicker, and as the uterus resumes its natural state of insensitiveness, the contractions are not any longer recognised unless exaggerated during suckling.

It is not impossible that a something akin to this is going on in the unimpregnated uterus; at least, we find not unfrequently that mental emotions and other exciting causes do bring on a forcing sensation in the empty womb.

In the case mentioned by Dr. Tanner already described, and in cases where I have removed intra-uterine polypi, there is clear evidence of the contractility of the uterus in the intermittent manner, but these cases occurred upon handling and irritating the organ. That of pregnancy is spontaneous.

The only other conditions at all resembling pregnancy are those which occur from retention of the menses in utero,

collections of pus, or of serum. I am sorry I have not been able to observe whether in these states the uterus spontaneously or upon irritation has the power of contracting. It would be highly desirable to obtain information upon this point. To these we shall again allude.

Let me next consider the effects or uses of these contractions. It is possible that there are others, but two appear to be tolerably clear.

In the *first* place, *it will provide for the frequent movement of the blood in the uterine sinus and decidual processes*, for as the sinuses of the uterus are so much larger than the supplying arteries, the current is more slow in them than in the ordinary systemic veins. The contraction of the walls through which the sinuses meander tends to send the current onward, and to act somewhat as a supplementary heart.

Besides this, *it facilitates the movement of the fluid in the intervillal space of the placenta, or in that which is called the placental sinuses*. Whatever view we may hold of the structure of the placenta, whether, on the one hand, there be blood amongst the villi in maternal sinuses, or, on the other, merely a serous fluid, in any case it is through one or the other medium the villi absorb the material for the aëration, &c., of the fœtal blood; and there can be no doubt that from its position it must be more or less in a stagnant state, for even if it be blood, this entering in by small openings into a much larger area, and making its exit also by small openings, must necessarily proceed at a very much slower rate, as has been pointed out by Dr. A. Fare, article Uterus, 'Cyclopædia of Anatomy and Physiology.' It is not difficult, therefore, to recognise the effect which the change in the solidity and shape must produce on the fluids in the placenta as well as on that of the uterine walls; in other words, the contractions act as a kind of supplementary heart to the fluids in the uterine walls and the placenta.

In the *second* place, the uterine action *adapts the position of the fœtus to the form of the uterus*. There has been, as is well known, much dispute as to the cause of the head presenting so frequently in labour as it does. There can

be little doubt but the more recent opinion is the correct one, namely, that the motions of the fœtus combined with the preparatory pains of labour to secure the head to present. For it has been also well shown that the head of the fœtus when folded up in utero is not really the larger end, but that the body with the limbs forms the greater portion; and as the uterus is larger at its fundal end than below, the fœtus folded up corresponds to the shape of the uterus only when the head presents at the os.

But this explanation has been weak in one point, namely, that the head presents in all the later months of pregnancy (although not quite so regularly) long before the pains of labour have set in.

The feebleness of the explanation seems to be corrected in part, if not altogether, by the recognition of these contractions to which I am endeavouring to draw attention. During the whole of pregnancy this silent power is being exerted, so that, be there little or much liquor amnii, in other words, be the child freely floating or closely pressed by the uterus on the approach of full term labour, yet there is a time, even so early as the fifth or sixth month, when the uterine contractions must act on the fœtus in a manner similar to that in which it is supposed to act on it during the last stage of pregnancy. The remarks and quotation above given show how clearly Dr. Tyler Smith had pointed out this effect of the uterine contractions.

Let us now discuss of what value in the diagnosis of pregnancy is the intermittent action of the uterus.

In the before quoted passage Dr. Tanner says, "But it seems that as the peristaltic motions occur whenever the uterine cavity becomes enlarged from any cause, it necessarily appears objectionable to instance such movements as a trustworthy sign of pregnancy."

To these remarks I would make this rejoinder. For the last six years and upwards I have made use of the intermittent action of the uterus as the principal symptom upon which I have depended in the diagnosis of pregnancy. I

am not aware that I have been less successful than others in determining the existence of pregnancy ; on the contrary, I have felt myself at an advantage in the possession of an additional sign to make up the deficiency or temporary inapplicability of the others ; as, for instance, when external noise prevents the heart sounds from being heard.

But leaving egotistical expressions, let us consider what are the other causes of enlargement of the uterine cavity, in order that we may see how far they are practically liable to impede our diagnosis.

They are five in number : 1, retained menses ; 2, hydro-metra ; 3, collections of pus ; 4, polypus ; 5, large fibroids, nearly polypoid.

We will dispose of these *seriatim*, and first, *retained menses*.

In the first place it would be very rare to find a case of retained menses, without severe periodical monthly pains. If such a case presents itself we always examine per vaginam, and then the obstruction is detected. But it is possible that a case may present itself to us—indeed, I have met with one such—where an obstruction exists in the vagina almost insuperable to the escape of the menses from the very small opening, and yet a pregnancy ensues. Now, in this case, of course much obstacle to diagnosis must arise, because of the difficulty of exploring the lower portion of the uterus. In such an event we should, independently of the stethoscope, be enabled in almost every case to make out the presence of the foetus within the tumour, which we should recognise as being the uterus by its power of contractility. The foetal presence, detected by the hand and stethoscope, would point out the true state of the case. But also in almost every case of occlusion occurring in those who have already borne children, there is a history of severe labour, or some sign which would lead us at once to institute a vaginal exploration.

But supposing that a girl fell pregnant before the appearance of menstruation, of which I have known one case, then

under these circumstances we should, of course, always institute an internal examination, because in any case it is necessary to make out the actual condition.

Almost always retention of menses in early life results from *vaginal* obstruction, and the majority of those after also; in these cases the uterus itself does not become distended by the secretion till the vagina above the obstruction is dilated to the utmost, and then gradually the uterus enlarges. But this distension is not gradual as in pregnancy, but at each monthly "period" it becomes rapidly larger, subsiding to a certain degree after the "period" has subsided. The decrease in all cases is very well marked. Thus we can feel through the parietes two swellings, the upper one the smaller; and as this is so unlike the pregnant uterus, we can scarcely, with any ordinary amount of attention, mistake one for the other; even supposing, which has not yet been proved, that the uterus distended by menses contracts intermittently, as does the pregnant uterus.

2nd, *hydrometra*, and 3rd, *retention of pus* in the uterus.—Both of these conditions are very rare; both require an occlusion of the os or cervix uteri. The causes of this occlusion would be sufficiently well marked to place the probability of pregnancy aside; but if any doubt existed, vaginal examination would show occlusion, or the state of a developed uterus as in pregnancy. And supposing that vaginal examination were unattainable, then the absence of any solid within (assuming that the uterus in these diseases presented the same phenomena as in pregnancy, which, as I said before, is still unproved), would be sufficient to distinguish these conditions. When *hydrometra* attains a great size, it possibly might be confused with *hydrops amnii*; but collections of pus in the cavity of the uterus, seldom, if ever, become larger than the uterus in the fourth month of pregnancy.

Practically their infrequency during the menstrual epoch might permit us to ignore them as a source of difficulty in the diagnosis of pregnancy.

The *fourth* cause of uterine distension is polypus. In the first place, it is very rare to find a polypus in utero so large as to be confounded with pregnancy, without metrorrhagia. This latter was a very prominent symptom in Dr. Tanner's case above quoted. It would not interfere therefore with the diagnosis of normal, but of abnormal pregnancy; and principally with that form where carneous mole was present,

For if there were a pregnancy coupled for some time with hæmorrhages, if the ovum were not converted into a solid form, the fetus would be felt during the interval of relaxation; and it is in these cases where very frequently, the fetus being already dead, we are deprived of the employment of the stethoscope, that the advantage of the alternate relaxation and contraction in diagnosis is well shown. Because not only does it show that the tumour is wholly uterine, but by the flaccidity we can tell that the contents are not of a solid nature, for although when the organ is fully contracted over an ordinary ovum the density is as great as if there were a fibroid or polypus within it, yet when it relaxes it is seldom that the laxity is not sufficiently complete but that we can at once satisfy ourselves that a solid of the size of the uterus is not contained within.

Again, it would be a very rare case of polypus where the uterus had by its distension grown as rapidly as it would have done in pregnancy; certainly a polypus so large as to be like a seven months' pregnancy must have taken a long time to grow, and it would be very rare that it should have been unnoticed till within that period.

In the case of a carneous mole, however, there may be some difficulty in distinguishing it from a polypus, especially in a patient seen only lately; because by physical signs they are scarcely distinguishable. By the history, however, we may generally glean information that the menses had absented themselves for a greater or less time. However, the difficulty always has been great, but it is not increased by the knowledge of the intermittent contractility of the uterus.

Taking, however, only the tactile symptom in distinguishing

polypus from pregnancy, we may say that the uterus in pregnancy, when relaxed, becomes quite flaccid, and that a moveable solid is felt floating readily about in it, whereas with polypus, although possibly we may feel the difference between the contracted and relaxed conditions, yet it is so very slight that there is no likelihood of their being confused.

But of course we do not always tie ourselves to only one symptom; and the other symptoms of pregnancy, amenorrhœa, the size of uterus compared with the date of the absence of menses, the state of os uteri, &c., will assist us in our diagnosis, even if the auscultatory signs be absent.

The above remarks apply to the *fifth* cause of distension of the uterine cavity, namely, to fibroid tumours of the uterus, when these project polypus-like into the cavity, except that it is highly improbable that we should find any sensible amount of contraction. In any way it would only be in the case of carneous mole that any difficulty could possibly arise; from this the long standing hæmorrhages, frequently the want of symmetry and persistent solidity, with absence of changes about the os uteri, would enable us to distinguish the fibroid tumour.

Thus it appears to me that the difficulties which would seem at first sight to be caused by the assumption that the uterus distended by diseases contracts intermittently as when distended by pregnancy, readily vanish on closer acquaintance, so far as is required in practice. The knowledge of the fact does not add to our difficulty, whilst it gives us another sign which adds materially to our ease in the diagnosis of pregnancy.

But not only are we assisted in our diagnosis of pregnancy from other uterine tumours, but still further are we helped to distinguish uterine from non-uterine enlargements.

Because if we find a tumour varying in consistence at

intervals, it is quite clear that it must be the uterus, as far as our present information guides us.

There is only one doubt on my mind, derived from the absence of information as to whether the bladder in retention of urine possesses a perceptible intermittent action. That it contracts periodically under accumulation of urine there can be no doubt, but how far this is palpable remains yet open to observation. Of course there is no difficulty in clearing up the question between bladder and uterus, either by vaginal examination or passing the catheter; still, the absence of any solid within will clearly distinguish the vesical from the uterine tumour.

There is one form of abnormal pregnancy which, possessing a consistence between carneous mole and ordinary pregnancy, and being without the presence of the fœtus, may be liable to give rise to difficulty—I mean the vesicular mole or hydatini-form degeneration of the chorion. In this form I have distinctly found the intermittent contractions of the uterus, yet in the state of relaxation no fœtus can be found. Of course, if we examine per vaginam we shall find a more or less patulous os uteri, history of rapid growth, with, most probably, some short suspension of the menses, succeeded by sero-sanguineous discharges. The absence of all foetal signs, the want of complete fluidity, coupled with the intermittent contraction, will point out that a pregnancy without a fœtus exists, and will, sufficiently with the other signs, show the absence of other diseases distending the uterus.

There is also great advantage to be found in the facility with which in many cases we can obtain an approximative diagnosis. Whilst engaging the patient in conversation the abdominal examination can be carried on without arresting attention such as auscultation would do. If we found a swelling which relaxed at one time and became firm at another, this would be quite sufficient to guide us as to the advisability of insisting on a more complete examination. And then, supposing also there was amenorrhœa, the patient having been "regular" before, the general health being at the same time good, with or without sickness, we may be quite assured that

we may extend the examination to a more complete degree without committing ourselves unnecessarily.

In conclusion I may add that, whilst endeavouring to point out the proper position, as a diagnostic sign, of this intermittent action of the uterus, I do not wish to underrate the value of the auscultatory signs of the foetal presence, but rather when these, from circumstances, are unattainable or impeded, then this sign proves itself of much more value than authors have, as yet, attributed to it.

I have not added any cases to illustrate the above remarks, because, as the phenomenon is so constant and so easily recognised, and its applicability to diagnosis self-apparent, it would be unnecessarily occupying the attention of the Society to relate instances.

Dr. BARNES called attention to the work of Dr. Tyler Smith, in which the peristaltic movements of the pregnant uterus were well described, not only as forming the basis of the expelling force during labour, but also as characteristic of pregnancy.

The PRESIDENT, in answer to Dr. Barnes, replied that the extract he quoted from Dr. Tyler Smith had escaped his notice. He should be pleased to add it to his paper.* But Dr. Tyler Smith had referred to the peristaltic movements, the result of external excitation, while that which had been just described occurred spontaneously. It was not necessary to use cold hand or friction, and it could be obtained before the uterus could be recognised through the abdominal parietes. Both the text-books and other works at home and abroad were silent on the subject of the paper except so far as the quotations showed.

* N.B.—This has consequently been done in the body of the paper.—ED.