

THE USE OF ELECTRICITY IN MIDWIFERY.

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It requires no very great stretch of imagination to fancy the more conservative among you saying to themselves, as they glance at the title of this paper: "I suppose some young enthusiast is going to try to make us believe that electricity is capable of doing almost anything in midwifery, and that our time-honored drugs and instruments must be thrown aside, and our obstetric outfit reduced to a battery and a few electrodes." If there be any such here to-day, let me relieve their minds at once by stating that it has been the aim of the author to avoid the rosy-hued descriptions so often indulged in by writers upon the medical uses of electricity, and to confine his paper to a concise and scientific statement of some points which his own experience has led him to think may be of practical interest to his fellow practitioners.

There are many occasions on which the resources of the obstetrician are taxed to the utmost, and our science has not yet become so exact that we can say, with certainty, that this or that remedy will be the appropriate one for a given case. Even the physician of large experience, who has learned to make the most of what is at hand, cannot afford to ignore any measure, however trivial, which has been found helpful in practice; and it is hoped, therefore, that the value of electricity in midwifery will be judged, not by theory, but by the actual test of experience. It is not an agent which will suit every case, or which can be applied according to mathematical rules; like other therapeutic measures, it

frequently fails, but, nevertheless, it possesses certain important advantages which, in the opinion of the writer, entitle it to a permanent place in the recognised resources of obstetric art. Whenever the generic term "electricity" is employed in this article, it is to be understood that it refers to faradisation, as this form of electricity is by far the most useful, as well as the most convenient for our purpose.

For convenience in description, its more important uses may be considered under three heads, viz. :

I. Its sedative action.

II. Its oxytotic action.

III. Its power to prevent and to control uterine hæmorrhage.

I. *Its Sedative Action.*—Happily, public opinion no longer considers it improper to attempt to relieve the sufferings of the parturient woman, and those physicians who still persist in withholding remedies which are known to mitigate the pangs of childbirth, do so, not because they believe that woman is doomed "in sorrow to bring forth children," but from a deep conviction that the administration of such drugs is not for the best good of their patients. At our last meeting, I took occasion to express myself as heartily in favor of the judicious administration of chloroform in most cases of labor, but I recognise that chloroform has some disadvantages, and I am sure that all of us would gladly welcome any agent which, while exerting a marked sedative effect, would not interfere with the progress of labor, or tend to produce post-partum hæmorrhage. Such an agent is to be found in the faradic current of electricity, but you will be disappointed if you expect it to exhibit this action in every case. I regret very much that my own experience with faradisation does not permit me to endorse the claims made for it by Dr. W. T. Baird, of Texas. In an article written by him, and published in the *American Journal of Obstetrics* in 1885, he says that the suffering can be as effectively relieved in the painful parts "as

we would *dare* to relieve it with anaesthetics *for any great length of time*," and adds that he has never known of a case in which it has failed to give all the relief demanded by the patient. This is pretty strong language, and is only applicable to some of the more striking cases which have come under my observation. In his experience with electricity in midwifery, the writer has met with the same uncertainties and disappointments which characterise the action of other remedies, and he has thus far been unable to formulate rules which would be of much assistance in determining which cases are most appropriate for its use. In saying this, however, he does not wish to be understood as implying that it is more difficult of application than such remedies as chloroform, morphine, and chloral; but only that in this field, as elsewhere in medicine, empiricism must play an important part.

But, you ask, what are the special advantages, then, of electricity over other remedies? In the first place, it is useful where chloral or morphine is contra-indicated on account of idiosyncrasy or debility, or where it is not considered prudent to push these drugs any further. It is also available where the stomach is too irritable to retain medicine, and where it is inconvenient or impracticable to resort to rectal administration. Faradisation, unlike morphine or chloroform, does not interfere with the progress of labor by stopping "the pains," but, on the contrary, excites more powerful and efficient uterine contractions, at the same time that it quiets the general nervous irritability. It also possesses the distinct advantage of not favoring uterine relaxation and haemorrhage, and its use, therefore, does not complicate subsequent operative procedures under anaesthesia, should these be demanded.

The manner in which the faradic current produces sedation has long been a fruitful subject for speculation, yet, up to the present time, but little is definitely known about it. The older writers compared its action

on the nerves to that of counter-irritants upon disease processes ; or, in other words, they claimed that, by producing a profound impression upon the nerves of sensation, it prevented them, for the time being, from transmitting the sensation of pain. More recently we have been told that it probably causes anaesthesia by producing a sort of rapid inward percussion upon the nerves. That the number of vibrations of the current have much to do with its anaesthetic effect has been admirably shown in a recent paper, read by Dr. William F. Hutchinson, of Providence, before the American Electro-Therapeutic Association. He has had constructed an induction apparatus, in which the usual spring vibrator has been replaced by a metallic ribbon, which may be readily adjusted to vibrate in unison with any desired note ; and his experiments upon the human subject with the current from this apparatus have brought out the remarkable fact that, when this ribbon sounds the note of C major, or is vibrating about thirty-two thousand times per minute, the maximum anaesthetic effect is obtained. So marked was the anaesthesia that he was enabled, in one instance, to open a felon without causing the patient any pain whatever. I mention these experiments, not only because they throw some light on the action of the faradic current upon the sensory nerves, but because they show plainly that we cannot expect to obtain this exceedingly useful effect of the current from every little induction apparatus which we may happen to employ.

II. *Its Oxytocic Action.*—If there be one action of electricity more certain than another, it is its power to evoke and stimulate uterine contractions ; hence, in every case of tedious labor in which the delay is due to feeble or infrequent contractions of the uterus, or where, owing to slight disproportion between the foetal and maternal parts, unusual muscular exertion is required to deliver the child, faradisation is indicated, and will usually render efficient aid. Not infrequently the exhibition of its sedative action is immediately followed by a distinct

advance, thus showing that, in practice, its sedative and oxytocic actions cannot always be separated. In persons of sensitive temperament, a slight benumbing effect, whether produced by drugs or by faradisation, is sufficient to encourage the patient to "bear down" more vigorously, and so make better use of the "pains" of the second stage. One of the most beneficent properties of electricity is exhibited in what may be termed its "steadying effect" on "the pains," by which is meant that the uterine contractions, when severe and almost incessant, are made less frequent and more efficient. It is just here that one appreciates the importance of that rest which is afforded the uterus when the contractions are of the regular rhythmical type seen in a perfectly normal labor.

Notwithstanding all that has been written and said against the danger of administering ergot to hasten labor, there are not a few practitioners who persist in this practice. To these physicians, as well as to those who are often sorely tempted to use it in this way, but who have moral courage enough to refrain, I would recommend a trial of faradisation. The action of ergot is slow, and uncertain in degree; faradisation produces its effect instantaneously, and the amount can be accurately gauged. Ergot exerts its influence for a variable length of time, which is entirely beyond control; faradisation acts upon the uterus for just so long a period as the operator desires—it can be instantly checked, and as quickly resumed. Ergot produces a tonic cramp of the uterine muscle, which unnecessarily exhausts the mother, and is dangerous both to her and to the child; faradisation produces a steady, rhythmical contraction of the uterus, which allows a proper interval of rest to the uterine muscle, and closely imitates Nature's method. In no class of obstetric cases does electricity possess such signal advantages over other and better known measures as in that in which a safe, speedy and certain oxytocic agent is indicated. I say "indicated," because there

are many cases, besides those due to simple inertia of the uterus, in which such an agent is desirable. Thus, there is often a slight narrowing of the pelvis, or the foetal head is unusually large, or is abnormally ossified, causing a tedious labor, and yet, at the commencement, it is impossible to say whether or not delivery can be safely effected without instrumental aid. Under such circumstances, it is true conservatism to make an effort to accomplish delivery without resorting to instruments or to an operation, and this is especially so when that effort does not involve any additional risk. No evidence has yet been brought forward to show that electricity, as ordinarily applied, is harmful, either to mother or child, so that one has nothing to lose and everything to gain from a trial of its oxytocic properties.

Faradisation is likely to prove very useful in those occasional cases in which the induction of labor becomes imperative. On account of the comparative rarity of this procedure, only one such case has come under my personal observation in which this agent was so employed, but, in this instance, its action was so admirable as to place it far in advance of the methods usually recommended. In cases of inevitable abortion and miscarriage, it is also an extremely valuable agent; but this will be again referred to in considering its action in the third stage of labor.

III. *Its Power to Prevent and to Control Uterine Haemorrhage.*—Under this head will be considered more particularly its usefulness in the third stage of labor. As in all cases where uterine inertia already exists, or is likely to be present, there is danger of haemorrhage in the third stage. The indication is to employ such treatment as will place the uterus in the best possible condition to prevent such a mishap. The usual practice is to do little more in the way of prophylaxis than to guard against undue exhaustion of the patient, and to avoid emptying the uterus too rapidly. The best authorities advise against the use of ergot until it is certain that the second

stage of labor will be completed within a very few minutes, and many prefer waiting until the child is delivered before administering this remedy. The writer prefers the latter plan, and is of the opinion that the giving of ergot a short time before delivery is often responsible for difficulty in removing the placenta. This objection does not apply to the use of electricity, for, as has been already stated, the contractions of the uterus which it produces are entirely under the control of the operator. Among the more common causes predisposing to post-partum haemorrhage may be mentioned rapid emptying of the uterus, and the use of chloroform to the point of *producing profound anaesthesia*. Where there is imperfect contraction of the uterus after the delivery of the placenta, or where post-partum haemorrhage is imminent or is actually present, faradisation is very useful, and when the haemorrhage is not excessive may be all that is required. I do not wish to be understood as advocating its use in the face of an alarming haemorrhage, to the exclusion of well recognised methods of treatment, for this might mean the loss of valuable time, and, perhaps, even of a life; but, if the electrical apparatus be in readiness beforehand, as it should be, it will be found a valuable adjuvant to other methods, just as a hypodermic injection of ergot may give temporary aid after the obstetrician has removed any portions which may have been retained in the uterus, and when, perhaps, a few precious moments would otherwise be lost while hot water for a douche was being brought to the bedside or its temperature was being adjusted.

Electricity is also useful in aiding the expulsion of the placenta. Most obstetricians will be able to recall cases in which, owing probably to fat abdominal walls, or, still more commonly, to distension of the bowels with gas, the placenta has been delivered only after considerable manipulation, which has left the abdomen sore and tender. By calling electricity to our aid, we shall be able, in most

cases, to expel the placenta with scarcely any manipulation of the abdomen, and with a trifling loss of blood.

Analogous to the assistance rendered by electricity in the third stage of labor, is its action in cases of abortion. Here, it may be resorted to with good effect, saving much time and annoyance, both to patient and physician, by doing away with the necessity for prolonged manipulations, and so diminishing both the dangers and the discomforts attendant upon such accidents. For instance, in those cases of early abortion, occurring in women in whom the cervix is high and the ostium vaginae quite small, it need hardly be said that the removal of the contents of the uterus is often attended with much difficulty, yet it is just under such conditions that faradisation does yeoman service; for it not only causes the expulsion of the contents of the uterus, but also guards against one of the most common complications, *i. e.*, haemorrhage.

From what has been already said, one would very naturally and properly infer that electricity would be useful in cases of sub-involution, and while this is true, the limits of this paper prevent a consideration of this, and such kindred subjects, as the use of faradisation to stimulate the secretion of milk, or for the relief of the vomiting of pregnancy.

It has been the object of the writer, thus far, to give a general idea of what may be expected from faradic electricity in obstetrical practice. It remains now to consider briefly, a few illustrative cases, and then take up some practical points regarding the technique of its application.

As some of the following cases were observed in hospital practice, jointly by Dr. Irwin H. Hance and myself, I am indebted to him for some of the clinical notes:

CASE I.—A GOOD SEDATIVE AND OXYTOMIC; PROMPT CONTROL OF POST-PARTUM HAEMORRHAGE AFTER FORCEPS DELIVERY.

Ipars; twenty-eight years of age. The first stage lasted twenty-one hours, and the pains were fifteen or twenty minutes apart. At the begin-

ning of the second stage faradisation was begun, and was kept up almost continuously for forty minutes. The pains were then more vigorous, and came on about every five minutes, yet the electricity produced a marked sedative effect, which was commented upon both by the patient and the nurse, although I had been careful to refrain from saying anything about the severity of the pain. The current was then applied for some little time longer, but only during the pains, which became somewhat less frequent again, but still quite strong. The head was obstructed at the pelvic floor, and after waiting a considerable time, the forceps were applied under full chloroform narcosis, and delivery effected in twenty-five minutes. The tonic contraction of the uterus was not very good after the delivery of the placenta, and there was a small gush of blood, which was instantly checked by the application of the electrode.

CASE II.—A GOOD SEDATIVE AND OXYTIC.

Ipars; twenty-two years of age. The first stage was characterised by almost constant knagging pains, and after some hours, although the patient was quite plucky, she became very nervous, and her pulse rose to 120 beats per minute. At the time of beginning the faradisation, the os was about two and a half inches in diameter, thick, and unyielding, and the head of the child was quite high in the pelvis. In from three to five minutes it was evident that the patient was suffering much less, although the uterine contractions were frequent, short, and sharp. In a few minutes more the os was fully dilated, and the head on the perinaeum, and the child was delivered in half an hour. The electricity was applied at intervals during this period until just before the delivery of the head. The patient had become quite calm, her pulse had been reduced to 104, and was of better quality, and the uterine contractions were much more regular and effective.

CASE III.—A GOOD SEDATIVE AND OXYTIC; USEFUL IN THE THIRD STAGE; EFFECT OF VARYING THE INTERRUPTIONS IN THE CURRENT.

Ipars; twenty-five years of age; a large and strongly built woman. The dilatation of the os was very slow, so that thirty-six hours after the first pains began, it was only about two inches in diameter. Seven hours later, notwithstanding the use of several hot vaginal douches, and the evacuation of considerable liquor amni, the os was not much larger, and the pains were irregular, short, and inefficient. The full strength of the current from a large faradic battery was then applied in the usual way, and after about fifteen minutes of almost continuous application, the pains had become more regular and frequent, and had increased in severity, yet the patient was much quieter, and expressed herself as experiencing much less pain. The application of the current lasted for half an hour. After this, the progress was more decided, and the os was fully dilated in a little less than four hours. There was slight obstruction to the descent of the head in the pelvis, so the forceps were applied, and the head soon delivered by gentle intermittent traction. There was some little difficulty in delivering the placenta, and its expulsion was followed by more than the usual

amount of bleeding, and although this was checked by ergot and hot douches, the uterus remained flabby. The faradic current was again applied for about five minutes, with the result of causing a firmer contraction of the uterus, and preventing further hæmorrhage.

In this case, it was found that the most work could be obtained from the current with the least inconvenience to the patient, by adjusting the contact-breaker so as to make very fine interruptions during the intervals of the pains, and changing to coarse interruptions as soon as the uterus began to contract.

CASE IV.—PROLONGED FIRST STAGE FROM RIGID OS; FARADISATION FAILS BOTH AS AN OXYTOCIC AND A SEDATIVE; CHLORAL SUCCEEDS.

Ip̄ara; twenty-one years of age. She had pains at short intervals for four days before any dilatation of the os was evident. When the os had reached two inches in diameter, there was scarcely any further progress. The uterine contractions occurred every three minutes, and were very strong, but with each pain the os would dilate to nearly the full size, and then contract to its former size when the pain subsided. During the night the patient received three hot vaginal douches, and thirty grains of chloral, but with little benefit. A strong faradic current was then applied, almost continuously for fifteen minutes, and then only during the pains, for fifteen minutes more. The uterine contractions then became very severe, and recurred every two minutes, but there was no advance and no sedation, and the faradisation seemed to cause so much discomfort, that it was stopped. During the next four hours, the patient received three hot vaginal douches, and thirty grains more of chloral. She then came pretty well under the influence of the drug, and at the same time, it was noted that the child's head was lower, and that the cervix was receding. The progress of the labor from this point was uninterrupted, and the child was born two hours later.

This case is worthy of special notice, not only because of the failure of electricity to accomplish good results under conditions which seemed theoretically to be peculiarly appropriate for its use, but because it also shows that the writer does not wish to convey the impression that electricity will accomplish wonders in every case. Contrast this case with the following:

CASE V.—GOOD OXYTOCIC ACTION, AND SOME SEDATION; CHLORAL FAILS.

Ip̄ara; twenty-eight years of age. The first stage was quite slow, the os being only about one inch in diameter at the end of twenty-four hours. The cervix was thin for a long time before the os dilated, and the head was low down in the pelvis, but the pains were not very strong. Chloral failed

to assist the dilatation. The faradic current was applied continuously for twenty minutes, and produced some sedation. The second stage began fifteen minutes later, and was completed in half an hour.

**CASE VI.—MARKED SEDATION, ALTHOUGH NO EFFECT UPON THE OS;
PELVIC CONTRACTION; FORCEPS DELIVERY.**

Para; twenty-five years of age. After being in the first stage for twenty-four hours, suffering severely, it was found that the os was only about two inches in diameter, and its margins quite thick. There were severe uterine contractions every five minutes, and hot douches and morphine had given no relief. Faradisation was employed continuously for thirty minutes, with the effect of producing more efficient uterine contractions at longer intervals, and causing the entire disappearance of the knagging pains in the back and hypogastric region. After the second stage was reached, it became evident that the mother would require assistance, so the forceps were applied, and delivery effected.

This case is presented in order to show that even in the presence of pelvic deformity, relief from pain may be obtained by the use of electricity, when morphine in appropriate doses has failed. In view of the fact that, in such cases, it is probable that an operation under an anaesthetic will ultimately be required, it is obvious that it is safer to apply electricity, than to administer chloral or chloroform.

CASE VII.—INDUCTION OF LABOR IN FIFTEEN MINUTES, BY FARADISATION.

This patient, a primipara, thirty-one years of age, with a decidedly phthisical family history, had suffered for a long time previous to her pregnancy, from gastritis, and had been further debilitated during pregnancy, by persistent nausea and vomiting. After her admission to the hospital she rejected all stimulants and food, with the exception of a little milk and carbonic acid water. In view of her wretched and somewhat precarious condition, it was decided after consultation that, as the computed time of her confinement had arrived, it was not advisable to wait any longer, and that labor should be at once induced. On the day she had expected to be "sick," there were no uterine contractions, and no indications of the onset of labor; the os only just admitted the tip of the finger, the vertex presented in the L. O. A. position, and the foetal heart was beating strongly. The patient was very weak, and excessively nervous and apprehensive. The electrodes were applied in the usual manner over the sacrum and abdomen, and the strength of the faradic current adjusted so as to be slightly disagreeable, but not painful. While the current was being applied, Dr. Hance attempted digital divulsion of the os. The first uterine contraction occurred four minutes after applying the current, and

several others followed in rapid succession. At the end of twelve minutes from the beginning of the application the os had dilated sufficiently to admit two fingers. Faradisation was then stopped for a few minutes. In twenty-five minutes from the beginning of the seance the os admitted three fingers and was quite dilatable, and the pains were returning regularly at intervals of three or four minutes. In the next twenty-five minutes the current was applied only during the uterine contractions. The pains were now only two minutes apart, the mother was much more composed, and her pulse was 68, regular, and fairly good. Labor being now well established, faradisation was discontinued. The first stage lasted four hours, and the second only thirty minutes.

CASE VIII.—EXPULSION OF THE PLACENTA BY ELECTRICITY; LESS THAN THE USUAL BLEEDING.

Ip̄ara; twenty-one years of age. The faradic current was applied only during the pains near the termination of the second stage, and was then omitted for about five minutes, until the umbilical cord had been ligated. On again closing the circuit, the uterus promptly contracted, and in a moment the placenta was forced into the vagina. Although chloroform had been administered sparingly during the last few expulsive pains, the delivery was attended with practically no hæmorrhage. About three years later I attended the same lady in confinement with her second child. The first and second stages together only occupied a little over two hours, chloroform was given in the same way during the last fifteen minutes of the second stage, and faradisation was not employed at all. There was considerable more blood lost than at her first confinement, when the electricity was used, but the amount still did not exceed that found in many normal deliveries.

CASE IX.—HOUR-GLASS CONTRACTION; ADHERENT PLACENTA; FARADISATION FAILS.

Ip̄ara; thirty-three years of age. After applying the current for a reasonable time, it was found that the expulsion of the placenta was hindered by a contracted ring in the lower segment of the uterus, and also by the placenta itself being adherent. An examination of the placenta after delivery showed its cotyledons to be unusually large and soft. No ergot had been administered.

CASE X.—PLACENTA EXPELLED: IMMEDIATE ARREST OF A SLIGHT POST-PARTUM HÆMORRHAGE.

Ip̄ara; twenty-five years of age. An application of the faradic current in the usual way caused the prompt expulsion of the placenta from the uterus into the vagina, and then, very gentle downward pressure with the electrode resulted in the placenta being immediately forced outside of the vulva. Just after stopping the current there were a few gushes of blood from the uterus, but this hæmorrhage ceased immediately on closing the circuit again, and after a few minutes the uterus remained firmly contracted without artificial aid.

The foregoing cases are representative ones, and have been selected with the object of showing what electricity can do and what it cannot do in the practice of midwifery. Looking over those cases, of which I have preserved careful notes, and in which electricity has been employed with a specific object in view, I find that in twelve cases in which faradisation was employed for its *sedative* and *oxytocic* effects, its sedative action was shown in eight, and its oxytocic action in nine cases. In twenty out of twenty-seven cases, in which it was employed in the *third stage* of labor, it materially aided the expulsion of the placenta, and in three out of four cases of *moderate* bleeding, occurring immediately after delivery, it promptly checked the flow and produced firm uterine contraction.

No doubt by this time some of you have been thinking that this employment of electricity in midwifery is pretty in theory, and, perhaps, useful in hospital practice, or where there are more facilities for using electrical apparatus than ordinarily fall to the lot of the general practitioner, but that it is of very doubtful application to the every-day routine of practice. I hope to show that such is not the case, and that the effects described in this paper may be obtained without the use of any elaborate, expensive, or cumbersome apparatus. I find no objection to the treatment on the part of the patients or their friends. On the contrary, they are gratified at the effort the physician makes to relieve the suffering, and are not slow to compare this practice with the more common one of sitting at the bedside and turning a deaf ear to the patient's pleadings. Do not misunderstand me on this point. I am no advocate of "meddlesome midwifery," but I do believe that the accoucheur should stand ever ready to assuage the sufferings of childbirth whenever this can be done with safety to the mother and child; and while leaving much to Nature, he should be constantly on the alert to see when art can aid her. If in a severe and prolonged case of labor we can safely reduce

the patient's sufferings and conserve her failing strength by causing the pains to come at longer intervals, and then to do more efficient work, it is certainly our duty to do so. Chloral, we know, will accomplish much under such circumstances ; but let us not forget that electricity may do as much, or more, and with even less risk to our patients.

The needful appliances are, a portable faradic battery, two or three electrodes, and the necessary conducting cords. It is all important that the battery should be so constructed as to require very little attention while in operation, and also when not in use. It is desirable that the contact-breaker should be capable of nice adjustment, so that the current may be "made" and "broken" *evenly* ; and just here, I would say that it would be a great advantage to the obstetrician to have the usual contact-breaker replaced by the new "singing rheotome" which Dr. Hutchinson has devised for the purpose of making very rapid vibrations. This instrument, as I have already said, has only just been brought to the notice of the medical profession, but I feel quite confident that had I had it at the time I was attending the cases described in this paper, the sedative effects of the current would have been still more remarkable. As, in a general way, it may be said that a current from a coil of coarse wire is the most appropriate for stimulating muscular fibre to contraction, and that from a fine wire coil most suitable for producing sedation, it is desirable to have the faradic apparatus provided with such coils. Where, however, one desires to have a very small battery which can be carried in the coat-pocket or in the obstetric bag, some of these refinements must be sacrificed to portability. A very useful machine of this class is the one known as "the Smith & Shaw Closed Cell Battery." It is not nearly so dirty and wasteful as the well-known Gaiffe pocket-battery, and is in every respect a much more efficient instrument. The current is sufficient for most cases, but even the coil with two cells of battery, is,

in exceptional cases, hardly strong enough. It can be carried about charged, so as to be ready for use at a moment's notice. Each charge is sufficient to run the battery for a number of hours, and its renewal is quickly and easily effected.

The best method of applying the current to the patient is with the positive pole to the sacro-lumbar region, and the negative pole to the abdomen. Fairly good work can be done with two sponge electrodes applied to the abdomen on either side of the uterus, but this method is not so convenient or so effective as the one first described. The only precaution necessary in regard to the position of the electrodes is to place them so that the current will not pass through the head of the child. The method described will avoid such a danger in vertex cases, but where the breech presents, it is better to apply one pole to the sacro-lumbar region, and the other to the nape of the neck.

For the lumbar electrode, I use a small copper plate, to which is attached the conducting cord from the positive pole of the faradic machine. The portion of the cord near the plate should be covered with rubber tubing, so that it may be easily cleaned. When the electrode is to be applied, it is laid upon a strip of roller bandage and a thin sheet of *wet* absorbent cotton is wrapped around both the plate and bandage. The bandage is then fastened around the patient like a belt, and serves to retain the electrode in contact with the skin and in proper position, even though she be rolling about the bed. It matters not if the electrode be soiled with the discharges, for the rubber-covered cord and the copper plate are easily cleaned, and fresh absorbent cotton and bandage are used for each case. Unless very powerful currents are required, the best abdominal electrode is the operator's hand, as he is kept constantly informed concerning the strength of the current, and more important than all, he can keep the uterus in his grasp. This will be particularly appreciated by any one using faradisation in

the third stage of labor, for with an ordinary sponge electrode, it is a very easy matter for the uterus to relax and escape around one or the other side of the electrode. Where the hand is used, the operator takes an ordinary sponge electrode in one hand, while the other is applied to the abdomen, or, the conducting cord from the negative pole is connected to a metal band fastened to his wrist. The objections to this method of application are the weariness it produces in the operator's hand and arm, and the fact that if the current be sufficiently strong to be effective, it is very disagreeable to some persons who are especially susceptible to its influence. The best substitute for the hand is a flat sponge, insulated at the back with a piece of sheet rubber. In selecting such an electrode, it is important to see that the back is very flexible. Another method is to connect the negative cord with a small metal ball, which is placed in the centre of a large sponge. The operator can then grasp the sponge with the naked hand, or can protect his hand with a rubber glove.

Before beginning the application one should always be careful to see that both electrodes are well wetted with warm water, that the strength of the current is reduced to the minimum, that the contact-breaker is adjusted to work smoothly, and that the current is turned off from the electrodes. Both electrodes are then placed in position, the current turned on, and its strength very gradually increased until it is distinctly perceptible to the patient, but causes no pain. The circuit should be kept closed for ten or fifteen minutes, when the sedative effect should be evident. When this is once obtained it is only necessary to keep the circuit closed during the pains. When used for its oxytocic effect the current should be strong enough to be disagreeable without being decidedly painful, and should be applied intermittently in imitation of the normal rhythmical contractions of the uterus. When it is desired to employ electricity in the third stage of labor to facilitate the

delivery of the placenta and to encourage firm uterine contraction, the circuit should be closed as soon as the child is delivered, and a mild current applied to the uterus. Unless it is evident that this will cause the expulsion of the placenta prematurely, the current need not be broken. If the uterine contraction be sluggish the strength of the current should be rapidly increased, when there will usually be a sudden and powerful contraction sufficient to expel the placenta. It must be remembered that adipose tissue is a very poor conductor of electricity, and that, therefore, in women with fat abdominal walls, the results are likely to be very disappointing unless powerful currents are employed.

To recapitulate :

(1). The necessary apparatus is neither complicated nor troublesome.

(2). The application of electricity in cases of midwifery requires no special technical skill, and is, therefore, applicable to the needs of the general practitioner.

(3). Electricity exhibits its sedative effect in parturition sufficiently often to make it worthy of trial where the physician is reluctant to administer chloral or chloroform.

(4). Electricity assists labor by increasing the force and efficiency of the natural uterine contractions. It is prompt and reliable, and is entirely under the control of the operator.

(5). The use of electricity in the third stage of labor aids the expulsion of the placenta, and diminishes the risk of haemorrhage.

In conclusion, the writer ventures to express the belief that every physician who may be induced to give electricity a fair trial in his obstetric practice will find in it a valuable ally, but one which no more deserves to be considered infallible than do the other remedial agents at our command.