longations from this clot extended for a short distance into the superior and inferior venæ cavæ, and in the left ventricle was a more recent red clot extending into the aorta. Microscopic examination of the right auricular wall showed slight myocarditic and well-marked endocarditic changes, whilst the blood clot was seen to be made up of a dense network of fibrin with red and white blood corpuscles lying in the meshes. The clot was noted to be firmly continuous with the endocardium. Between the endo- and myocardium were seen greatly dilated capillaries. The tricuspid valve was firmer and thicker than normal; but the other cardiac valves showed no morbid appearances. The foramen ovale was filled up, but not yet closed in by the membrane.

III. GYNÆCOLOGICAL CASES TREATED BY ELECTRICITY IN PROFESSOR SIMPSON'S CLINIQUE.

By W. Fraser Wright, M.B., formerly Buchanan Scholar, University of Edinburgh, and late Clinical Assistant, University Gynæcological Wards, Edinburgh Infirmary.

The subject of my communication to this Society to-night is one about which so much has been ably written, and by men of authority, that I have naturally much hesitation in bringing it before an audience so able to criticise and discuss it. But I am fortified by the idea that facts, and *facts only*, will be laid before you, with such slight and imperfect interpretation as my necessarily limited experience enables me to put upon them. For although there have been endless papers and discussions upon *the* question which above all others engrosses—and will likely for some time—the attention of the whole gynæcological world, yet it seems to me that much of the literature on this subject is of comparatively little value. For it is the fact that communications dealing with details of cases treated by electricity form an insignificant minority when compared with those recording impressions of its utility as a therapeutic agent; and *mere records of impressions and opinions, however correct and exact they may be, are of practically little value compared with the data from which these impressions have been received.*

So important does it seem to me—and I hope I do not exaggerate this importance—to have the cases themselves presented as well as the results, so that we may see which are, and which are not, benefited by the electrical treatment, that I venture to-night to lay before you, as clearly and shortly as possible, the few observations I have been able to make on the subject. The number of cases is not great, but much time and care have been bestowed upon them, so that the results may be taken as reliable: all diagnoses having been confirmed by men whose capacity in this respect cannot be questioned.

The cases treated were those which came to the Buchanan Ward of the Royal Infirmary while I was Prof. Simpson's hospital assistant, and had charge of his beds during the year 1887–1888, to whose kindness and supervision I am greatly indebted. Several other cases were treated during this time; but as these, for various reasons, got only one or two applications, it is obviously of no use including them in this series.

My purpose then is to relate, as shortly as possible, the symptomatic and physical condition of each patient on admission, the treatment employed, with the result, and the patient's condition a year afterwards—this latter point being of great importance. This takes up much time and space, but I must rely on your kind indulgence, feeling that such a recital is the only way to make the observations of any practical use to the Fellows of the Society. The paper is purely clinical, and I must carefully keep clear of all speculation and theoretical discussion as to the rationale of the treatment, fascinating as such a subject is.

To facilitate discussion, and to enable the Fellows to follow me with more interest than would be the case if a bald recital of case after case were given, I have divided the material into four groups, according to the symptoms presented, for these are after all what render treatment necessary.

In this connexion it is interesting to note that in a book recently published by Dr Thomas Keith and his son, dealing with 106 cases of fibroid tumours of the uterus—or at least suspected fibroids, for some turned out apparently to be malignant—in only eight cases did the patient come complaining of the presence of a tumour or swelling; in all the others the complaint was of some symptom to which the tumour gave rise.

This work being undertaken at a time when there was much discussion as to the efficacy of electricity as a means of treatment in gynæcology, my object was to find out, as far as possible, whether the treatment did good or not, whether it could arrest hæmorrhage, relieve the symptoms, and diminish the size of fibroids, as some maintained; or whether it was of no use at all, as others held. But, as is usual with new methods of treatment, I have found that it is not so useful as some would have us infer, or so useless as others suppose; but that between these two extremes the real truth apparently lies. For without a doubt, in my hands at any rate, the treatment has been very successful,—and successful, moreover, in a class of cases in which no other treatment, except hysterectomy or removal of the appendages, would have possibly done good. Whether one is justified in removing appendages, or the uterus itself, without first of all giving the patient the chance of being relieved, and possibly cured, by this new treatment, is a question I must leave for the consideration of those whose operative experience enables them to speak with some authority. I am not qualified to discuss the point.

This, indeed, has been a very vexed question ever since Apostoli introduced his new method. To me it seemed premature to discuss it, as no one really knew how much or how little electricity could accomplish. Even now it is only on trial, and all criticism should be withheld till a sufficient number of data can be accumulated, upon which to form a permanent valuation; and this must yet take some time.

I would, however, venture to urge the important necessity of those engaged in this work publishing details, and *details of all cases*—successful or not—so that all may have an opportunity of forming an opinion as to the cause of failure. It is only in this way that any real progress will be made.

Having made these preliminary remarks, I will now proceed to relate the cases, which for convenience may be divided into the following four categories:—

1. Bleeding fibroids.
2. Fibroids causing pressure symptoms, especially in connexion with the bladder functions.
3. Fibroids in which the tumour caused pain and dysmenorrhœa (a scanty flow often being associated).
4. A miscellaneous group, in which inflammatory exudations are the most important.

During the course of electrical treatment to which these cases were subjected, ergot and all other drugs and treatment were withheld; so that, except when otherwise stated, there is only the one probable cause for the result.

Details of the Cases.

A.—Fibroids, with Hæmorrhage as the chief symptom.

Case I.—Mrs C., æt. 27, married five years, sterile. Was admitted to Ward XXIV. first on 22nd August 1887, complaining of great difficulty in making water, pain in abdomen, and increased monthly loss.

Up till four years ago her periods lasted four or five days, but then she noticed that they gradually were becoming longer and the discharge much more profuse, so that for some time the duration had been eight to twelve days. A year and a half after this, she began to experience great difficulty in passing water, especially at the periods, when it had to be drawn off almost constantly with a catheter. There had been also great dysmenorrhœa during this time, and continual pain in abdomen between "times."

A fibroid was found on the posterior wall of the retroverted uterus, blocking up the pelvis, and quite fixed. It was very painful to the touch.

She was treated by rest in bed, ergot, etc., and attempts were made to lift the mass out of the pelvis by bags, filled with air and water,

placed sometimes in the rectum and sometimes in the vagina, and also manually under chloroform; but all to no purpose. She went away after six weeks without being at all improved, and returned on 20th December to undergo similar treatment, but again without any good result.

She was admitted a third time on 18th April 1888, by which time we had a battery. Her condition was, if anything, worse than before, the catheter being constantly required, there being great abdominal pain and menorrhagia. The patient was quite unable to walk owing to the pain it caused, and was consequently totally unfit for her housework.

The vaginal canal was found to be encroached upon by a mass of firm, hard tissue, which, bulging through the posterior fornix, filled the pelvis, and was immovable. It was very sensitive. The cervix uteri lay high up behind the symphysis, and was directed upwards and forwards, so that it could barely be touched with the tip of the finger between the symphysis pubis and the tumour mass. *Bimanually*, it was impossible to make out the uterus as distinct from the tumour mass. The whole thing was about the size of a fœtal head, and quite fixed. Evidently, then, the case was one of a fibroid growing from the posterior wall of the retroverted uterus. It was quite impossible to get a sound into the cervical canal.

The tumour was punctured with the steel trocar, which was made negative. Fourteen applications were made, the first on April 19th, and the last on October 2nd, 1888. The intensity varied from 50 to 150 mà. (milliampères), and the duration from five to ten minutes, more frequently ten minutes. The mass was punctured through its most prominent part in the posterior fornix, about 1½ inches behind the cervix, and the previous puncture was allowed always to be nearly healed before a fresh one was made. This generally took a little over a week, but for various reasons it was not convenient to make the applications so often. Still punctures can be made with safety every week; if oftener, there is risk.

During this treatment she improved greatly, passing through five periods, whose average duration was seven days, the amount being greatly lessened. This is a point of some interest, showing, as it does, that hæmorrhage may be arrested by a process other than positive intra-uterine cauterization. The micturition became much less difficult, so that the catheter was required only nine times during these six months; whereas, just previous to admission, it was necessary every time she required to pass water. There was also great diminution in the pain, so that the patient was able to walk quite comfortably, attending as an out-patient during the latter half of the treatment. There was a distinct diminution in the size of the tumour mass, so that it no longer blocked the pelvis, but was quite distinctly movable, and without causing pain when grasped bimanually.

Further History.—On 9th October 1889, *i.e.*, twelve months after cessation of treatment, the patient was looking better than ever, able to do her housework, and felt in better health than she had been for years. The bleeding remains much less than formerly, although during the past month or two it has been rather more profuse than at the immediately preceding periods. The micturition disturbance also remains improved. During the last two or three periods she has required the catheter once during each period, but for the five preceding months it was not once needed.

Perhaps this case ought to be put in the second category, owing to the pressure symptoms being so prominent, but as the bleeding was also a very marked feature, and especially as it was greatly lessened by puncturing and not by positive cauterization, I thought it well to include it amongst the hæmorrhagic cases. One question I would ask about this case: If electricity had not been available, by what other means could such a good result have been obtained?

Case II.—Mrs J., æt. 34, has had two children, the last born ten and a half years ago. She was admitted to the ward on 16th April 1888, complaining of great weakness, pain in back and legs, and being too much unwell.

For the last six years patient had had menorrhagia, the periods occurring every twenty-eight days and lasting fourteen days, while previously they only lasted three or four. There was also severe dysmenorrhœa, and pain in back and legs constantly. She had been treated three times already in Professor Simpson's ward by ergot, hot douches, vaginal plugging, etc., and although slightly improved on each occasion by this treatment, she quickly relapsed into as bad a condition as before on going home.

On making a vaginal examination, the cervix uteri was found directed downwards and only slightly movable. Through the right fornix a firm, dense mass was felt, connected with the uterus, and evidently a fibroid. It could be felt also slightly through the anterior fornix, and much more distinctly through the posterior. Bimanually a firm mass was felt the size of a four and a half months' pregnancy. It was quite immovable, and tender on pressure. The tumour was apparently connected with the right border and posterior wall of the uterus.

The indication here being to diminish hæmorrhage, the positive pole was introduced into the uterus. She received five positive electro-cauterizations of 100 to 150 mà. from five to ten minutes—*i.e.*, the intra-uterine sound was made positive—between 19th April and 12th May. On the 14th May she suffered greatly from pain in left iliac region and down left leg. Fever soon developed, with diarrhœa and vomiting. On vaginal examination a large mass was found occupying left iliac region, very tender on pressure, and firm

to the touch, so that *a left-sided cellulitis had developed.* The tumour itself was also swelled and very tender.

This complication soon gave way to treatment; but as she was left in a very weak state, she was sent home to get a rest before the electrical applications should be resumed. She was accordingly dismissed on 22nd June 1888, feeling weak, but otherwise very well. The pain in back and down legs was quite away, but it was impossible as yet to say if there was any change in her menstruation. The pelvic condition was unchanged, there being not the slightest alteration in size or consistence of the mass, except, perhaps, that it was a little denser.

Further History.—On 16th August 1889, fourteen months afterwards, I made the following note:—After leaving hospital in June 1888, patient continued in good health till the beginning of 1889, menstruating regularly as before every twenty-eight days, the periods lasting now four instead of fourteen days, the flow being very slight, and the pain almost *nil.* After this the pain began to trouble her again, but comparatively slightly, the bleeding meanwhile remaining pretty natural, till three months ago, when if anything it got a little more profuse, the period lasting five days. Her general health is good, and she feels quite as strong as ever she was.

Per Vaginam.—The tumour is decidedly smaller, being about the size of a three and a half months' pregnancy. It is not painful, is movable, and the sound goes in only $3\frac{1}{4}$ inches. Previously it went in $4\frac{1}{4}$ inches.

Here, then, the hæmorrhage was greatly diminished, and the tumour lessened in size. It is interesting to note that this diminution in the size of the tumour occurred not immediately after the applications, but only after the lapse of some time, which would point, perhaps, to the current having brought about some alteration in the nutrition of the tumour, which resulted in its decrease. At any rate, the effect is clearly different from what takes place in many other cases, when a distinct diminution in the tumour mass immediately follows upon the applications. Then, too, the cellulitic attack is important. Here I must confess it is extremely probable that it was the result of carelessness in introducing the intra-uterine electrode, especially as this was always very difficult, and I was often in a great hurry. It is scarcely possible to account for it in any other way, as the intensity of current was never over 150 mà., and only attained this once. Indeed, I often wondered that this woman's uterus was so tolerant of the rough usage it often got, and that a cellulitis had not been set up long before.

Case III.—M. F., æt. 36, unmarried, no children. Sent by Dr Carmichael to Professor Simpson, and admitted on 12th May 1888. She complains that she is too often unwell.

The patient, who is a cook, menstruated regularly from age of 16 every twenty-eight days for seven days at a time, there being always a considerable flow; but since the beginning of the year she has menstruated every ten or fourteen days for four or five days at a time, and during the last three weeks the flow has been constant. Dr Carmichael attended her throughout this time, but could not diminish the bleeding.

Per Vaginam.—There is a large fibroid mass connected especially with the anterior wall and right border of uterus. It is the size of a four months' pregnancy, and the sound passes in 3½ inches.

Ten positive electro-cauterizations were made, each of 100 mà., and for five minutes—the first on 6th June, and last on 21st August, patient attending as an out-patient for the last two.

Now, during this time she passed through three menstrual periods, the first being after the third application, and lasting five days. This bleeding occurred exactly three weeks from the cessation of the previous one, and was the shortest she had since the beginning of her trouble. The second occurred twenty-five days after this, and lasted only three days—the shortest period in her life! The third occurred again after twenty-five days, and lasted again three days. This ended on 28th August, and on 6th September 1888 her pelvic condition was as follows:—There is a distinct diminution in size of tumour, which now equals about a three months' pregnancy, and is quite movable. Sound passes still 3½ inches.

Her general condition is very much improved, she having gained 1 st. 5 lbs. weight during the four months she has been under observation.

This, then, is a very good result. I am unable to say anything about its permanency, as she has left Edinburgh, and I can find no clue to her whereabouts.

Case IV.—H. F., æt. 57, unmarried. Came to attend as an out-patient on 16th July 1888. No children. She complained of being unwell too frequently, and too much at a time.

Seven years previously this patient passed the menopause, and remained quite well and free of any kind of discharge till one year ago. During her whole menstrual life she had been quite regular in her menstrual habit. But a year ago the bleedings recommenced, being quite irregular in their interval, and lasting two or three days. In November 1887 she had rather a severe flooding, and since that time there has been an almost constant bloody discharge, with an occasional intermission of two or three days at the most. She is exceedingly nervous and alarmed at her condition, especially as all manner of medicinal treatment has failed.

Bimanually a large fibroid is felt, especially affecting the anterior wall and right border of uterus. It is about the size of a five months' pregnancy, lies more to the right side of the middle line,

is freely movable, and not tender on pressure. The sound passes in 4½ inches, and is felt to grate on the roughened and friable uterine mucous membrane. This caused a good deal of bleeding.

Twenty-one positive electro-cauterizations were made between 16th July and 9th October 1888. The intensity at first was 100 mà. for five minutes, but the latter half of the applications were, on the average, 230 mà. for five minutes.

During this course of treatment there was at first no change at all, but gradually the bleeding became less, so that during the last six weeks there was not a drop save after an occasional application, and this ceased in an hour or so.

The tumour became harder in consistence, but its size remained unchanged on 9th October 1888.

The after-history of this case is of great interest.

On 20th December 1889, fourteen months later, I have this note:—Since the battery applications were stopped she has been *entirely free* of discharge, except on three occasions, viz., in March, then four months after this, and a third four months after the second, *i.e.*, six weeks ago. But although I am bound to mention these as discharges of blood, there was the merest trace, amounting to only a few spots on the diaper.

A leucorrhœal discharge, from which also she had suffered, entirely disappeared ten days after cessation of treatment, and has not since reappeared. Her general health is excellent, and she considers herself perfectly well.

Per Vaginam.—The tumour mass is distinctly smaller, but not much. It is also denser and much more easily defined by palpation than before. The sound passes in only 3½ inches, and still causes slight bleeding.

Here, again, hæmorrhage has been stopped, and the tumour diminished. The symptoms in this case were very interesting and unusual, viz., hæmorrhage coming on seven years after the menopause, so that a suspicion of malignant disease arose, and, indeed, this diagnosis had been made by her medical attendant who sent the case to Professor Simpson. Time has, however, I think, verified the diagnosis of fibroid made eighteen months ago. At the present time she is in robust health.

Here, also, no diminution in the size of the tumour could be detected till some time after cessation of treatment.

Case V.—K. Q., æt. 39, unmarried, no children. Was admitted on 14th August 1888, complaining of excessive loss of blood at her periods, which had become very irregular.

This patient dates her illness back to September 1887, to an occasion when she went into the sea to bathe at a time her period was due. This period did not come, nor did she see anything till December 1887, when she had a bleeding which lasted three weeks. An attack, apparently of peritonitis and oöphoritis, now

supervened, and her next period did not occur till the end of May 1888, when she was poorly a fortnight. Since then she has seen nothing. Previous to this, menstruation was regular, of the twenty-eight day type, and lasting four or five days.

On physical examination, a rounded mass is felt through the anterior fornix, and also on palpating hypogastric region of the abdomen. Bimanually this is found to be due to an enlargement of the uterus, which in size equals a three and a half months' pregnancy. The enlargement is chiefly connected with the anterior wall, but the left side is also affected, and at the upper left corner there is a nodule which gives the whole mass a slightly irregular outline. Sound goes in 3½ inches. It can be moved round in utero, showing that the cavity is expanded. It is evidently a fibroid connected with the anterior wall and left side of uterus—partly intra-mural and partly sub-peritoneal. Here the positive pole was tried in utero, although the two months' amenorrhœa seemed almost to indicate the negative.

Ten positive electro-cauterizations were made, the first on 24th August, and the last on 21st October 1888. Average intensity, 200 mà., except the first, which, to test her susceptibility, was only 50 mà. Average duration, five minutes. During this time there were three periods,—1st, on 26th August, lasting seven days; 2nd, on 22nd September, lasting five days; and 3rd, on 29th October, for five days. She went home on 13th November 1888 much improved in her general health, but the pelvic condition was exactly as when she came in—no diminution in size whatever.

Further History.—On 31st July 1889, patient came to report herself. Since going home she has kept very well—as well, she says, as ever she was in her life. The menstrual periods have been regular every month, lasting three days, and unaccompanied by pain. She takes her food well, and has been quite able for her duties as mistress of a girls' school in Yorkshire. Previously she was unfit for this work She is quite satisfied with her condition, and says she would not know she had a tumour at all.

Per Vaginam.—There is no diminution whatever in the size of the mass. Sound still passes 3½ inches.

The manner in which the periods returned with their normal regularity after positive applications is interesting. If the current was the means of bringing this about—and it seems fair to assume this—I am at a loss to explain it. Still, the benefit she derived is undoubted. It must also be noted that there was no diminution in size of the tumour even after nine months; nor was there any increase.

CASE VI.—J. H., æt. 45, unmarried, no children. Admitted to ward on 20th August 1888, complaining that she was losing blood almost constantly.

This patient presented an exceedingly anæmic and pinched

appearance. The history was, that up till two and a quarter years before, she had menstruated regularly at intervals of twenty-one days, and from five to seven days at a time; but at this time, while travelling from Italy to London as a lady's-maid, and while poorly, the period lasted for a month. She then remained well for two or three days, when bleeding recommenced, and has continued almost constantly ever since. The hæmorrhage lasts three weeks, then a week's intermission occurs sometimes; but more usually it is two or three days. For the past eighteen months she has been treated by Dr Duddingston Wilson, but to no purpose. Accordingly he sent her to Prof. Simpson.

On physical examination, the uterus is felt to be enlarged to the size of a four months' pregnancy. It lies to the right, and is very soft, so that it is difficult to make out precisely. Most likely there is a fibroid affecting both anterior and posterior walls. The sound passes 3½ inches, and can be moved round in utero.

Eight positive electro-cauterizations—average, 180 mà. for five minutes—were made, the first on 24th August, and the last on 23rd September 1888. On the 28th September she left hospital very suddenly and secretly, so that there was no opportunity of ascertaining her condition. During the course of the treatment, however, the bleeding was very much diminished; after the third application there being scarcely a drop seen.

Further History.—On 2nd December 1889, fifteen months after treatment, Prof. Simpson and I examined the patient, and found the uterine tumour distinctly diminished and firmer to the feel. It was now approximately the size of a three months' pregnancy. She states that, since leaving hospital, she has remained in greatly improved health. The bleeding, although by no means normal, is very much better than it was, so that she has been able for the last six months to follow her occupation as a lady's-maid—a thing utterly impossible before.

Here decrease in size of tumour and diminution of hæmorrhage have followed the treatment. It is very probable that had this woman remained for more applications, the improvement would have been still more marked. As it is, her condition was a vast deal better after the treatment.

Case VII.—M. G., æt. 38, unmarried, has had one child born fourteen years ago. Admitted 12th July 1888, complaining of bleeding from vaginal orifice.

This patient's history is the following:—Up till two years ago, she menstruated regularly from the age of 12½ every twenty-eight days, the periods lasting seven days. At this time she began to lose much more blood every month, the duration remaining as before; but for the past eight months she has been bleeding almost every day, with an interval, sometimes of two days, and once or twice of a fortnight. And during this time, owing to the great

weakness induced, she has been unable to work as a cloth-weaver. She has been treated by Dr Gunn, of Peebles, but without any benefit, and he sent her to Prof. Simpson.

On palpating abdomen, a solid rounded tumour is felt in hypogastric region, its upper border reaching within 2 inches of the umbilicus. At its upper right corner there is a very sensitive rounded nodule, which is probably the right ovary. The rest of the tumour is not sensitive. A bruit is heard over right side of tumour.

Mensuration.—(1.) From upper border of symphysis pubis to upper margin of tumour, 5½ inches. (2.) Transversely from one side of tumour to the other, 6½ inches. (3.) Circumference of abdomen at most prominent part of tumour—*i.e.*, midway between umbilicus and pubis, 32½ inches.

Bimanually, the tumour is felt to be the size of a five months' pregnancy. On the whole it is rounded, but at the upper right corner there is a sensitive walnut-sized nodule (already mentioned), and another is felt on the anterior surface of the tumour, just beneath the abdominal wall. Sound passes 4½ inches.

It is a fibroid, probably intra-mural, with at least one sub-peritoneal nodule (that felt on anterior aspect of the mass), and with the right ovary displayed up to the upper right corner.

This patient got twenty-one positive electro-cauterizations varying from 100 to 250 mà., generally over 200 mà., and lasting for five minutes. The first was on 19th July 1888, and the last on 25th February 1889.

She did not stand the applications very well, as they frequently caused a good deal of pain in the tumour, and also severe frontal headache; besides, she had several angina-like attacks which considerably interfered with the treatment.

The result was that the *bleeding was not at all diminished—the only case of failure in this category.* The tumour was diminished to the size of a four months' pregnancy, measuring 1¼ inches less in the vertical, and ½ inch less in the transverse directions, and ½ inch less in the abdominal circumference. The nodule previously felt on the anterior surface of the mass became much more distinct, and another sub-peritoneal nodule (previously unfelt) was made manifest on the left side of the tumour. The nodule at the upper right extremity had become very sensitive and distinctly larger.

The further history is exceedingly important and interesting. On 17th July 1889—one year after—I found that the tumour was as large as originally, so that it had apparently increased in size since cessation of treatment. During the year she had been losing quite as much blood as before.

As the uterine cavity in this case was expanded, I thought it well to try the carbon electrode of Apostoli in the uterus instead of the thin platinum one which had been previously used, and which might not have cauterized the whole mucous membrane.

She got, therefore, four additional positive applications, varying from 200 to 250 mà., and on each occasion three successive cauterizations were made of three minutes each, so as to include the whole mucous membrane. This, however, had no effect on the bleeding, but the tumour mass was again diminished to the same size as after the previous twenty-one applications. She accordingly went home, but returned on the 5th October 1889 to go to Dr Croom, who recommended removal of the appendages.

On 8th October he operated, finding the nodule at the upper right corner to be the right ovary enlarged to about three times its normal size, and containing a cyst about the size of a walnut. This, with its tube, and the left appendages, which were normal and deep down in the pelvis, were removed, and the patient made a good recovery.

This exceedingly interesting case is also very instructive. It is very probable that the failure of electricity was due to the displaced right ovary, which was always greatly irritated by the abdominal plate. I am almost inclined to think that the electrical applications had much to do with the cystic condition of the ovary —at least in augmenting it—as it was much larger after the treatment than before. Here we have an illustration of the absurdity of supposing that removal of the appendages will always be rendered unnecessary by this new treatment.

Electricity was tried and found wanting, and then the cutting operation became rightly the only alternative. In another similar case, if, after a few applications, there should be no improvement, it would be one's duty to suggest surgical interference. Even if this operation is not followed by cessation of the bleeding, the patient is now in a much more hopeful condition for further applications.

It is important also to note the increase in the size of the tumour mass after the first series of applications ceased (showing that the diminution in size which they had brought about was only temporary), and, secondly, the diminution which was again quickly brought about by the second series.

Case VIII.—Mrs G., æt. 33, admitted 4th September 1888. She has had nine miscarriages and no full-time children. The first occurred fourteen years ago, two years after marriage, and the last two years ago. The time varied from the second to the fifth month. No ascertainable cause, except that in each pregnancy she became very fat, so that it may have been a case of "perverted nutrition" during pregnancy leading to abortion, such as I remember hearing Dr Fordyce Barker describe at the British Medical Association Meeting at Glasgow in 1888. Of course, the fibroid may have been the cause. She came complaining of pain in lower abdomen and being too much unwell, with floodings on several occasions.

The history was, that ten years ago, after a miscarriage at the fifth

month, an attack, apparently of pelvic inflammation, supervened, which kept her in-doors for four months. Since then the pain complained of has never left her. Menstruation began at 13 and continued quite irregularly, with intervals of from two to five weeks, and lasting five days, till the above miscarriage, since which time the amount lost became increased—the duration varying from three to fourteen days—with irregular intervals of two to five weeks as before. On several occasions she has had severe floodings. There is also much difficulty in micturition at times.

Per vaginam, the cervix is situated far back, and is directed downwards and to the left. *Bimanually*, the uterus is found to be enlarged to the size of a three months' pregnancy by a fibroid affecting the anterior wall and right border. The whole mass is inclined to the right, occupying the right iliac fossa. The fibroid is intra-mural. Sound goes in 3¼ inches.

She received thirteen positive electro-cauterizations, each of 200 mà. for five minutes. The first was on 6th September, and the last on 12th November 1888. During this time three periods occurred—the first, after the fourth application, lasting eight days, with quite as much loss as before, the second and third each three days, with a greatly diminished flow.

She stated that she felt very much better in her general health than before, and that her bleeding and pain were decidedly diminished.

Further History.—On 20th August 1889—nine months after treatment—there is the following note:—The bleeding since treatment was stopped has remained greatly diminished, having occurred regularly every twenty-eight days, and lasting four or five days, exactly as she used to be when normal, but that the type is now regular. But the pain in lower abdomen has been quite as bad as before, and there is no difference in the size of the tumour.

Here, then, the bleeding has been diminished, but there has been no alteration in the size of the tumour, nor any alleviation of the pain. Perhaps faradism would have relieved the pain.

B.—The second group includes those **Cases in which Pressure Symptoms were caused,** and in each case the bladder functions were interfered with.

They are three in number; but a fourth case has already been mentioned, and in that case (No. I.) it will be recollected that the bladder symptoms were entirely relieved.

CASE IX.—Mrs A., æt. 37, admitted 9th May 1888. Married thirteen years, sterile.

For the last three and a half years she has had great difficulty in making water, on several occasions the catheter being required. This occurs especially at her periods, which have, during this time, been of longer duration (eight days) than before, when they lasted

four days. During the past few months the menorrhagia and difficulty in micturition have been steadily getting worse, so that her present condition is very distressing. During her last period the catheter was used six times.

Per Vaginam.—A large fibroid mass can be felt through all four fornices. It completely blocks the pelvis, and extends up to midway between umbilicus and pubis. Sound passes 4½ inches.

Sixteen positive electro-cauterizations were made, average 170 mà. for five minutes. The first was made on June 6th, and the last on October 8th, 1888. After the first application there was a period of eight days, but for the first time for many months she did not once require the catheter to be passed.

During this time she passed through five periods, the duration of each being, as before, eight days, but the amount lost being less. Only twice was the catheter required. After treatment she had no difficulty in making water at all, and said she would be quite contented if her improved condition would just continue. Her general health was much improved. The tumour felt slightly smaller, but not to any great degree.

Further History.—On 9th October 1889 the patient called to report herself. Since going home the general improvement has continued. She has been losing less blood at the periods, but on one or two occasions it has been necessary to have recourse to the catheter. The best indication of the improvement in this case is, that ever since leaving hospital a year ago, she has been quite able to attend to her household duties, whereas, previous to admission, she was quite unfit for this, owing to pain (which has been entirely relieved) and the disturbance in micturition.

Case X.—E. G., æt. 45, admitted 25th May 1888. Unmarried. No children.

The onset of this patient's condition has been very gradual. Three or four months before admission she began to suffer severe pain across lower abdomen, accompanied by sickness and frequent desire to micturate, which latter symptom has become the most distressing, she having a desire to pass water every quarter of an hour. There has been also a slight—very slight—increase in the monthly loss during this time. *Bimanually,* there is a fibroid filling up the entire pelvis and only slightly movable. The mass extends up 3½ inches above the symphysis pubis. The cervix is directed upwards and forwards, and is situated behind the symphysis. The fibroid is apparently connected with the posterior wall of the uterus.

This patient received sixteen negative electro-punctures between June 6th and October 8th, 1888. The tumour was punctured through its most prominent part in the posterior fornix. The result was very satisfactory. The bladder trouble was relieved, so that she soon desired to pass water no more frequently than before

present condition began. Her periods returned to their normal (and this, again, without any positive cauterization as in case No. I.), and the tumour was very distinctly diminished in size, so that it was possible, on 19th October 1888, to lift it up above the pelvic brim, when an Albert Smith pessary was introduced to keep it up, and she was sent home.

Further History.—On 9th September 1889, eleven months after cessation of treatment, she writes to say that the improvement has continued, but that on one or two occasions (she thinks as the result of cold) there has been a return of her old micturitory disturbance for a day or two.

Case XI.—Mrs D., æt. 48, admitted 11th August 1888. Has had one child, born eleven years ago.

This patient complains of pain in small of back, with great difficulty in micturition, amounting occasionally to retention. These symptoms have existed for the last six months, and are getting worse. There is also incontinence of urine, so that she is constantly wet.

Per Vaginam.—Through the posterior fornix is felt a rounded hard mass bulging into the vagina. The cervix is directed downwards and backwards, is jammed behind the symphysis pubis, and forms a distinct angle with the aforesaid mass. Bimanually, there is evidently a fibroid connected with the posterior wall of the retroflexed uterus. The mass just fills the pelvis, and is quite fixed.

Seventeen applications were made between September 5th and December 30th, 1888, the first eleven being negative punctures, and the last six being negative electro-cauterizations, the average strength of each being 100 mà. for five minutes. The result was that the bladder disturbance was entirely relieved. The pain was slightly improved, and the tumour diminished in size but very slightly.

Further History.—On 10th October 1889—ten months later—the patient reported herself. Since leaving hospital there has been no trouble with her water at all. About four months after leaving she passed, per vaginam, a pear-shaped mass of firm tissue, but, unfortunately, did not keep it. No doubt it was a fibroid which had gradually become extruded by the current, as Apostoli and others have shown is often the case. After this she felt better than ever, and at present enjoys perfect health.

Per vaginam, a great change is noticeable. The mass, which before blocked the pelvis, is now represented by an apparently normally-sized uterus, somewhat bound down to the back and retroflexed. Dr Fordyce, who kindly gave this patient a few applications for me, also examined her, and was greatly struck by the change.

C.—The next group of cases is one in which **Pain was the chief complaint,** and this associated, generally, with a scanty flow.

Case XII.—Mrs L., æt 38, admitted 29th March 1888, married sixteen years. Sterile. Complains of severe dysmenorrhœa, which has existed for seven or eight years.

Her periods last for three days, and are accompanied by severe pain in lower abdomen and left iliac region, so that she is forced to go to bed. The amount of blood lost is very small. Several plans of treatment have been tried without avail.

On physical examination, there is found a large fibroid affecting the anterior wall and left side of uterus, and extending to within ½ inch of the umbilicus, so that the whole mass is about the size almost of a six months' pregnancy. The cervix is directed downwards, backwards, and to the left. The fibroid is subperitoneal. A small nodule is felt—the size of a pigeon's egg—through the anterior fornix on the anterior aspect of the mass. Sound passes in only 2½ inches.

Here it seemed to me that the negative pole, by increasing the menstrual flow, might thereby diminish the pain. Accordingly, she got thirteen negative electro-cauterizations, average 100 mà., for ten minutes, the result being that the three periods which occurred during the treatment were characterized by increased flow and great diminution in the pain. But the next two periods were exactly as they used to be, both as regards amount of discharge and pain, so that no alteration whatever in her condition can be attributed to the electrical treatment. The tumour was not diminished in the slightest.

Case XIII.—Mrs Y., æt. 42, admitted 16th April 1888. Married. No children, one miscarriage fifteen years ago.

Patient came complaining of severe and constant pain in the back and lower abdomen, with difficulty in micturition, leucorrhœa, and severe dysmenorrhœa. They have existed more or less for three years, and on several occasions complete retention has occurred, generally after a drinking bout. She is very alcoholic.

On physical examination, a large fibroid tumour, connected especially with the anterior wall of the uterus, and similar in size to a five months' pregnancy, can be made out. Sound passes in only 2¼ inches. The fibroid is subperitoneal.

Twenty-three applications were made—the first six positive cauterizations, and the rest negative—between 21st April and 3rd October 1888, average 140 mà., for seven minutes.

The result was that the leucorrhœa disappeared; micturition became more easy; but still, on several occasions, while attending as an out-patient, she came with retention brought about by drinking. The menstrual flow was increased, but there was no

diminution in the dysmenorrhœa, although the constant pain in the back and abdomen was quite gone.

Altogether her condition was a very improved one, but she did not give herself a fair chance, owing to her drunken habits.

The tumour was slightly diminished to the size of a four months' pregnancy. It also became denser, and one or two small subperitoneal nodules became manifest, as though they had been extruded from the main mass.

I have heard nothing of her since leaving hospital.

CASE XIV.—A. M'L., æt. 44. Unmarried, no children. Was admitted 12th June 1888, complaining of constant pain in lower abdomen and left iliac region, which had existed for three or four years. There had also been slight menorrhagia during that time, which had been getting rather better during the past few months.

On palpating abdomen, three distinct masses can be detected—one a hard round tumour, the size of a goose's egg, in the left iliac region; a second mass, in the right iliac region, about one-third the size of that in the left; and a third, in the middle line, extending to within two inches of the umbilicus. *P. V.* the cervix looks downwards and slightly forwards, and is pushed far back. These three masses can now be felt through the anterior fornix, and are apparently portions of a multiple subperitoneal fibroid connected with the anterior uterine wall, and displacing the uterus backwards. Sound passes in 3 inches.

She received thirteen negative electro-cauterizations—between 18th June and 14th September 1888, average 140 mà., for five minutes—with the result that there was no improvement whatever in the pelvic symptoms, the pain being as bad as before, but she felt very much stronger and more able to go about. No change whatever in the size of the tumour occurred.

Further History.—On 3rd October 1889—twelve months later—I have the following note:—Since the battery was stopped the patient's condition has much improved, there having been no pain at all for many months. For eight months after leaving Hospital her periods were regular every month, lasting eight days, but the amount gradually getting less, menstruation ceased altogether four months ago.

The tumour is distinctly, though slightly, smaller in size. In the middle line it reaches to $2\frac{3}{4}$ inches below umbilicus, *i.e.*, $\frac{3}{4}$ inch lower down than before.

It is quite likely that any improvement in this case is associated with the menopause, and not with the battery.

CASE XV.—Mrs F., æt. 40, admitted 13th June 1888. Married fourteen years, no children. Has had two miscarriages, the last eleven years ago. Complains of pain in back and across abdomen, and dysmenorrhœa.

She began to feel ill seven months ago, and consulted Dr Moir, St Andrews, who sent her to Professor Simpson. Previous to this many remedies had been tried, but without success.

Bimanually, one can make out a fibroid, partly intra-mural and partly subperitoneal, connected with the anterior wall and lateral margin of the uterus, and in size similar to a four and a half months' pregnancy. There are at least two small pediculated movable masses, about the size of a walnut, connected with the main mass—one felt in Douglas's pouch, and the other in the right iliac region. Sound, with the aid of volsella, passes in 3½ inches.

Eight negative electro-cauterizations were made—between 23rd June and 31st August 1888—of 120 mà., ten minutes; but, with the exception that the periods were somewhat lengthened, with more loss of blood, there was no alteration whatever either in the symptoms or size of tumour.

This case is not so satisfactory as it might be, owing to the small number of applications, but she could not come longer.

Further History.—On 7th October 1889, she writes saying that her condition has not improved at all since going home, and she contemplates another trial of electricity.

CASE XVI.—The next case is one which I bring in at the end of this group, as, although pain was not the chief cause of complaint, yet it was complained of along with a swelling in the abdomen—the only fibroid in the series in which a patient complained of the presence of a tumour directly.

Mrs T., æt. 41, admitted 30th April 1889, complaining of general weakness, pain in abdomen, and swelling of abdomen, all of which have become very manifest during the past six months. Sterile.

Menstruation has occurred regularly every twenty-one days for five days till ten years ago, when the period became lengthened to ten or fourteen days, but latterly this has got better, and quite recently she passed six periods without seeing anything. Last period lasted five days.

On physical examination, a distinct, firm, smooth-surfaced ovoid mass is seen and felt in the hypogastric region. It extends up to the umbilicus, and laterally to the junction of the hypogastric and adjacent iliac regions. It has a soft, doughy feel, and the parietes move freely over it. A distinct bruit can be heard synchronous with the heart. Vertically from pubes to umbilicus the mass measures 8 inches, and transversely 9 inches.

Bimanually it is a large fibroid—intra-mural—and causing enlargement to the size of a six months' pregnancy. It is quite movable. The chief tumour mass seems to be connected with the anterior uterine wall. Sound passes 4½ inches.

Here was a case in which the mere presence of the tumour producing abdominal swelling was causing discomfort. Intending to diminish the size of the mass, I used negative applications, as the

negative pole was supposed to have a greater destroying effect than the positive.

Twenty-five negative electro-cauterizations were made—between 8th May and 3rd October—varying from 100 mà. for ten minutes to 150 mà. for five minutes. The result was that her general health was greatly improved, her face acquired its old natural fresh colour, and for the last month pain was entirely absent.

On 21st October measurements were taken, which showed a diminution in the vertical extent of 2½ inches, and transversely of 3 inches.

Bimanually the mass felt like a four months' pregnancy, freely movable, and of the same consistence as before. The measurements, too, are less, in spite of the fact that there was an increased deposit of fat in the abdominal wall. I would here take the opportunity of referring to the deception that will often arise if implicit reliance be laid on external measurements alone. They are of no use whatever unless in conjunction with bimanual examination, as a tumour impacted in the pelvis getting smaller and rising out of the pelvis somewhat, may give a larger external measurement than before, although much smaller; and *vice versa.* This I have seen occur many times.

Here, then, the greatest diminution in the size of the tumour has occurred,—much greater than in any of the others,—so that mere change in the circumferential zone (which I suppose may surround every tumour more or less), alone, will not account for it. Some other process must also be at work.

Further History.—On 7th October 1889, she writes saying that since going home she has continued in her improved condition. She says,—"If I could live the short time with the same ease as I have done since I left the Infirmary, I would never complain." Her menstruation during this time has been very irregular, several periods having been missed, so that it is quite likely she is at the menopause.

D.—The anomalous group in which **Inflammatory Exudations** are the most important.

Cellulitis posterior binding down Uterus.

CASE XVII.—Mrs W., æt. 28, admitted 12th March 1888, complaining of great weakness and discharge from uterus, sometimes red and sometimes white. She has had two children, the last two years ago. Four months ago she caught cold at a period, and has not been free of pain since. The leucorrhœal and metrorrhagic discharge has also existed for the same space of time.

Per Vaginam.—The uterus is retroverted and bound down to the sacral hollow by cellulitic adhesions. The right ovary is very tender, and is prolapsed.

With the object of seeing whether the adhesions could be

removed, I placed a cotton-covered electrode in the posterior fornix, and made it negative. She received six such applications between 13th April and 9th May, varying from 100 to 200 mà., for five minutes. This, however, I found was a mistake, as they caused a shrinking and puckering of the vaginal mucous membrane which was in contact with the pole. In other similar cases I found that an intensity of 50 mà. or less was quite as efficacious, and did not cause any cauterizing.

The result was very satisfactory. The cellulitic deposit cleared up, the uterus became again quite freely movable, and resumed its normal axis, so that, on making a vaginal examination on 30th May 1888, her pelvic condition was normal. The discharge was entirely arrested.

Subinvolution.

CASE XVIII.—Mrs T., æt. 32, admitted 22nd May 1888 complaining of pain in lower abdomen. Has had two children, the last born nine years ago. For the past seven years she has been very much troubled with pain in the lower abdomen, which comes on exactly a fortnight after every period, and lasts three days. She traces it to lifting a heavy weight. The uterus is enlarged and subinvoluted, so that the sound goes in 3½ inches.

This, then, was a good opportunity to try the effect of the battery on a case of pure subinvolution, and as the negative pole is the more efficacious in causing absorption, she received seventeen negative electro-cauterizations, between 26th May and 2nd October 1888, of from 50 to 100 mà. for five to ten minutes.

There was not the slightest diminution in the size of the uterus, but the pain was greatly relieved. After the first application she ought, in ordinary course, to have had the pain, but, for the first time for seven years, it was entirely absent. This was the more satisfactory, as everything—drugs, douching, pessaries, etc.—had been tried in vain.

On 25th November 1888 she wrote, "I have had a period since coming home. Fourteen days after it I felt the pain, but not so bad as usual. I am sorry about it coming back again."

Since then I have entirely lost sight of the patient.

Pathological Anteflexion, Peritonitis posterior, and Endometritis.

CASE XIX.—Mrs H., æt. 44, admitted 4th June 1889. Has had six children and three miscarriages, the last occurring nine months before, and since which time she has never been free from pain in the right iliac region and a leucorrhœal discharge, which has left her very weak indeed. She has been treated by Drs Barbour and Skene Keith at different times, but without effect.

Per Vaginam.—The uterus is pathologically anteflexed, peritonitic bands being very distinctly felt through the posterior fornix. There is also endometritis.

Ten negative vagino-abdominal applications were made similar to the second last case, of 50 mà. each, the time varying from five to ten minutes. The first was on 9th June, and last on 12th September. The pain and leucorrhœa were entirely removed, but there was no change in the physical condition in the pelvis.

Further History.—This patient remained in very good health—although not quite strong, still much better than before—for nearly a year. She then became pregnant, aborted at the sixth week, and since then has been feeling the pain again. She desires to have the applications renewed, as they brought about such a beneficial change.

Cellulitis.

CASE XX.—To this next case I ask your close attention, as it is one of the most important and instructive of the whole series.

Mrs J., æt. 27, admitted 8th August 1888. *She has had four children, the last born 12th May* 1888. *Four days after the birth of this child she was seized with pain in lower abdomen, and very soon a swelling and hardness became manifest. In spite of treatment, her condition for the next three months got steadily worse, and she then sought admission for extreme weakness and emaciation, with pain and swelling in abdomen. The apparent cause of the attack was cold.*

On making a physical examination, *it was evident there was a large cellulitic mass, which could be felt through the abdominal wall. On palpating this mass, it was felt to be very firm and dense, and painful to the touch. It occupied, like a solid cake, the left iliac and hypogastric regions, and in the middle line extended up to about ¼ inch above the umbilicus. Its upper border extended from this point to the left anterior superior iliac spine, while the right border corresponded to a line drawn with a slight convexity outward, from ¼ inch above the umbilicus to the middle of Poupart's ligament on the right side.*

Bimanually, *this mass of exudation was felt to occupy a somewhat unusual position, viz., the space between the uterus and the anterior abdominal wall, so that, in great part, it surrounded the bladder. The left broad ligament was also filled up. Posteriorly, and to the right, the pelvis was normal.*

The sound passed 3 inches into the uterus, whose axis was normal, but the whole organ was slightly retroposed by the exudation.

Here, then, was a case I had long been looking and wishing for—a cellulitic mass so situated that it could be easily felt and mapped out on the abdomen, whose condition and extent, therefore, could be followed with great accuracy from day to day.

To discount any effect the patient's altered circumstances might have on the exudation, she was first put on the ordinary method of treatment for such cases, viz., absolute rest in bed, fomentations, poultices, painting with iodine, and hot douching, with iodide of potash internally. This was continued for a month, but without mak-

ing the slightest impression. For three months previous to admission also, it must be remembered, similar treatment had been adopted in vain.

Now, surely, it was time to try the effect of the current. Accordingly, on 3rd September, with the uterine electrode made positive, an application of 100 *mà. for five minutes was made. This was followed by other fifteen applications, the last four being negative electro-cauterizations, all the others positive. The strength varied from* 100 *to* 150 *mà., and the duration from five to ten minutes. The last was made on 23rd October. With what result? Well, on the 12th September, after three applications, "patient says she feels much stronger, and that the mass is less bulky. She is quite free from pain. The mass has distinctly diminished at its periphery."*

On 17th September (14 *days after the first application*) *the upper limit of the mass in the middle line is* $\frac{1}{2}$ *inch below umbilicus.*

4th Oct.—Mass still diminishing in size. She feels much stronger, and has gained in weight.

24th October.—There is absolutely no pain. The mass is practically entirely gone, there being the merest trace left in the form of a thickening felt vaginally through the left fornix. The uterus is now in its normal position, perfectly free, and the sound passes in only $2\frac{3}{4}$ *inches after repeated trials on different days.*

She is now feeling quite well, able to walk about with perfect ease, and to work, and has gained 1 *stone* 8 *lbs. since the battery was commenced,* i.e., *within the last seven weeks.*

The kind of application was changed on the last four occasions, as the resolution was becoming relatively slow, and I thought that, by substituting the negative pole, it might be hastened. But it made no apparent difference. Here the effect was almost entirely inter-polar.

Since going home on 25th October she has remained quite well.

It is impossible by writing to give an accurate idea of the benefit this woman derived from the electrical current. Everything else had been tried, and in the absence of this new method we would have been powerless.

Cellulitis.

CASE XXI.—Mrs I. M'K., æt. 50, admitted 6th September 1888, complaining of pain in back and right iliac region, and being too much unwell. She has had one child, born twenty years ago, followed by a miscarriage eighteen months later. She had been a widow for twelve years.

The patient enjoyed good health till six years ago, when she was attacked quite suddenly with severe pain in the right iliac region. The menstrual period, which occurred at this time, was lengthened to seven days, the duration previously having been five. Ever since this attack the pain has persisted and extended round to the back. The periods have gradually got longer, till now they last

ten days, and for the past two or three months she has scarcely been free from bleeding a single day.

She has been treated at different times during her illness, but without benefit. Lately she has been getting very much emaciated and anæmic, her appearance suggesting malignant disease.

On physical examination, the uterus is found lying to the front, normal in size and position. Sound passes in 2½ inches.

Through the posterior and right fornices a firm, dense mass is felt occupying the right iliac fossa. It is very dense and somewhat tender. The surface, felt through the fornices, is slightly irregular, with small nodular elevations. It is quite fixed, and binds the cervix to the right somewhat, while the uterine body is fairly movable. In size the mass is rather less than a three months' pregnancy.

There was some doubt as to the diagnosis, my own impression being that it was either a cellulitic deposit or old hæmatoma, most probably the former. Two eminent gynæcologists who saw the case differed from me and from each other, the one thinking it was a fibroid, and the other a case of malignant ovarian disease.

Hoping it might turn out to be inflammatory, she was tried with negative applications. The internal electrode, in the form of a cotton covered electrode, was tried, wrung out of a weak saline solution, and placed in the vagina at the junction of the posterior and right fornices. But in case no good should result, and as the bleeding would be going on meanwhile, I thought it might be good to try intra-uterine positive applications as well.

Accordingly four double applications were given, first a negative vagino-abdominal application, average 100 mà., for five minutes, to remove the supposed exudation, followed by an intra-uterine positive application, of average 150 mà. for five minutes, to stay the bleeding. The first was made on 6th September, and the last on 17th September, and after the first application there was not a drop of blood lost. The mass also steadily diminished in size, so that after three more negative vagino-abdominal applications—the last on 2nd November—she left the Hospital on 5th November 1888, with *the mass entirely gone*, there being not the slightest trace left. There had been absolutely no bleeding since the first application was made, and the pain for several weeks had been entirely absent.

Further History.—On 4th October 1889, eleven months after cessation of treatment, she writes to say that since leaving Hospital last November she has remained well. She has passed only four periods—in April, May, August, and October—with considerable loss each time, but no pain. Most likely this irregularity is connected with the menopause. She has enjoyed perfect health, and whereas before she was quite unable to work, she has been occupied since April as housekeeper in a large house. And she writes: "I have never been a day off duty. I have a good deal of running

about. I am housekeeper here, and have many duties, as the hunting season has begun, and we keep a good deal of company."

This case, then, is not only satisfactory, but instructive. It affords, perhaps, a clue to some of those fibroids which are said to be dissipated by the electrical current. For, had the gynæcologist who made the diagnosis of fibroid stuck to this opinion, then to him it would have been an instance of a fibroid entirely removed by the current. And so it is possible that many similar cases may be the result of a mistaken diagnosis.

The case was, I have very little doubt, most likely a cellulitic deposit, although it is impossible to entirely exclude the possibility of hæmatoma in the right broad ligament.

Cellulitic Deposit surrounding Piece of Ovary.

CASE XXII.—Mrs. R., æt. 38, was admitted on 5th September 1888, to have a plastic operation done for a large ventral hernia that had resulted from a previous laparotomy.

Two years previously her appendages had been removed by a South Shields doctor for pain in both iliac regions. The result of this was that menstruation, previously of the twenty-eight day type, became irregular, the intervals varying from seven to thirteen weeks. The pain has persisted in the right iliac region ever since the operation, but there has been no return of that previously felt in the left side. She has had eleven children, the last born four years ago.

Per vaginam a small nodule, scarcely the size of a walnut, can be felt through the right fornix. It is exquisitely tender to the touch, and is no doubt the cause of her pain.

Thinking that most likely a small portion of the right ovary had been left, and had become surrounded and pressed upon by condensed cellulitic tissue, it seemed that negative vagino-abdominal applications might dissipate the inflammatory tissue. Accordingly the vaginal cotton-covered electrode was placed in the right fornix, and six applications made, each of 100 mà., for five minutes—the first on 6th September, and the last on 3rd October 1888.

The little mass became distinctly smaller in size, and could be pressed upon without causing any but the slightest pain. After the fourth application the pain in the right iliac region entirely left her.

Further History.—On 6th October 1889 she writes to say that the pain remained entirely away for nearly three months. After that it again began to bother her, and has continued to do so till now. She therefore writes, and intends coming back for more applications. The plastic operation was not a success.

Old Peritonitic Adhesions binding down Uterus and Left Appendages.

CASE XXIII.—C. I., æt. 24, admitted 20th April 1888. Single. Has had one child, born a year ago.

Ever since the birth of her child she has been constantly troubled with pain in back and left iliac region, which nothing has been able to check. She felt it slightly during the latter half of her pregnancy, but it is only since the labour that it has grown so troublesome. She is a weak, anæmic girl, who has suffered much from rheumatism, and now has well-marked mitral disease. There is no evidence that she has ever suffered from gonorrhœa, but it is very probable.

Per vaginam the uterus is felt bound down to the sacral hollow and fixed by old peritonitic adhesions. The left ovary is prolapsed and enlarged, and exquisitely tender. It is surrounded by old inflammatory products.

Vagino-abdominal applications with the internal cotton-covered electrode placed in the posterior fornix were made. They were six in number, the first two being positive, the rest negative, average strength 80 mà. for seven minutes. The first was made on 21st May, and the last on 30th September.

Great pain was always caused by placing the internal electrode in position, so that her condition was aggravated rather than relieved by each application, and the treatment had to be given up without the slightest alteration either in the pain or in the pelvic physical condition.

Having seen at M. Apostoli's clinic in Paris the excellent results following faradic applications in cases of severe ovarian pain, I think now that this case might have been benefited by them, but probably not to any great extent either, as the sequel will show.

For her *further history* is very important. About the beginning of September 1889 she was admitted to Dr Croom's ward in the Royal Infirmary, when an attempt was made to remove the appendages, as her condition was as bad as before, and she had suffered great pain during the whole year,—this being now the only chance left. Those of the right side were easily removed, but it was found impossible to get at those on the left, there was so much matting of the tissues. She died on 19th September, apparently of exhaustion.

An autopsy was made next day, and the following condition revealed:—The uterus and left appendages are bound down by old peritonitic adhesions, the fundus being bound immovably to the back and right. The stump of the pedicle is seen on the right side to be firmly attached to small intestine by recent adhesions. On the left side it is impossible to make out ovary or tube by looking into the pelvis, but on feeling with the fingers and pinching up the matted tissue to the left of the uterus, they can both be felt, the tube thickened and the ovary small in size and prolapsed. From the left side of the uterus the left round ligament is clearly seen running outwards and forwards. There are also to be seen vessels running downwards and forwards from behind the left broad ligament. These at first looked like the left Fallopian tube, but turned

out to be bloodvessels. The left tube and ovary lie beneath these, and can only be felt, not seen. The small intestines are adherent by recent lymph to the upper border of the posterior and right lateral walls of the pelvis.

From this it will be seen how unlikely it was that anything could have permanently alleviated the pain due to the condition of the left appendages. This case contrasts well with No. XVII., in which, however, the condition was not of such long standing, and the adhesions were probably cellulitic, and not peritonitic. This latter distinction is, I think, of some importance.

Resumé.

Such, then, are the cases, and I would summarize in a few sentences the most important facts:—

1. There are 23 cases in all, and in each the constant current has been employed, necessitating 304 applications. Of these 41 were punctures — always negative; 125 were positive intra-uterine cauterizations; 103 negative intra-uterine cauterizations; and 35 vaginal applications with non-metallic electrode.

2. Eight cases were hæmorrhagic fibroids; seven were treated by positive intra-uterine applications, and one by negative puncture, as it was impossible to get a sound into the uterus.

3. In all but one the hæmorrhage was arrested, and the improvement maintained for at least a year after treatment. For this one exception a distinct and satisfactory cause was found.

4. It therefore appears that hæmorrhage may be diminished by a form of application other than positive cauterization, more observations being required on this point.

5. There were three cases—four really, if we include one of the hæmorrhagic cases—in which pressure symptoms, especially connected with the bladder functions, required treatment. All were greatly benefited, the improvement being apparently permanent.

6. Next there is a group of fibroids in which pain, especially at the periods, is the chief symptom. These seem to have not at all benefited by the constant current either physically or symptomatically (perhaps with the exception of one, which was slightly improved). These were mostly subperitoneal, and were treated by negative intra-uterine applications.

7. Of the 16 fibroids treated, in no case was the tumour entirely removed; but in 11 there was a diminution in size. In 1 only was this to any great extent, the amount of diminution in the others being insignificant, though appreciable to the touch; 5 were entirely unaffected, except that no increase in size could be detected. In 2 of these 5 the symptoms were relieved, and permanently; in the other 3 there was no relief.

8. The kind of application made no difference, so far as diminution in size is concerned, *i.e.*, whether positive intra-uterine, negative intra-uterine, or negative puncture. In some the diminu-

tion was apparent after a few applications, in others not till several months had elapsed after cessation of treatment.

9. Obstinate cellulitic deposits were removed by the constant current, but it appeared to have little or no effect on peritonitic adhesions.

10. In one case of subinvolution, where pain was a source of constant anxiety, the pain was relieved; but no effect produced on the size of the uterus by negative intra-uterine applications.

11. One case of pathological anteflexion with endo-metritis, which had resisted other remedies, was much improved symptomatically, but unaltered physically, by vaginal applications.

12. All patients, whether the pelvic condition was improved or not, felt much better in their general health after a few applications.

This, then, is the sum total of the whole—that symptoms caused by fibroid tumours were almost always relieved, at least hæmorrhage and pressure symptoms, while the tumour itself was diminished in size, and perhaps had its growth arrested; but to verify this more time must be allowed to elapse. Unmistakably, also, the constant current was found a powerful agent in causing the absorption of cellulitic exudations. I believe this will yet be found to be one of the most important indications for its use.

Further than this, from personal trial, I am unable to go; but desiring to see for myself how things were worked at the fountain-head, I went to Paris just after finishing this series of cases, and regularly attended for the space of three months the cliniques of M. Apostoli. It would take too much time to give even a short account of all I saw there; but I take this opportunity of recording the great obligation I am under to M. Apostoli for his great kindness and courtesy, and for the trouble and inconvenience he was always so willing to undergo for the purpose of explaining his methods. In the main I found that I had been pursuing exactly the same method in so far as the kind of application went, but at his clinique the variety of cases treated was very great. Here it would be out of place to criticise the cases, as they have not yet been published, but on the whole the results he obtained were so far exactly as I am pleased to be able to corroborate. Other cases—such as salpingitis, endometritis, etc.—were treated very successfully, but these could, I am sure, have been equally benefited by less tedious and difficult means; but I was much struck by the beneficial effect of faradic applications for ovarian pain.

And now it seems that the constant current must take a place in the treatment of some very important gynæcological affections; its efficacy in relieving the distressing symptoms of fibroids is a fact about which all who have given the remedy a fair trial agree. What place must we then assign to it? It is plain that simply

because it can arrest hæmorrhage it is not to be used in all bleeding fibroids, as most of these are effectively treated by ergot and like drugs. But some will fail to be cured medicinally. Such were the eight cases I have recorded to-night. For these a few years ago there was nothing left but operative interference; but now it has only been necessary to operate on one. And this is precisely the sphere in which the new treatment will find its greatest usefulness—in diminishing the number of fibroids requiring operation, for some of a surety must still require the surgeon. As a hæmostatic, then, it should be ranked with ergot; but with this great recommendation, that many cases unaffected by the drug will be cured by the current.

True, it is very troublesome and tedious, much more so than any surgical operation. Such is the opinion of those who ought to know; but I cannot help thinking that any treatment whatever, no matter how tedious to the practitioner, if successful, is better gynæcological practice than an operation for removal either of the appendages or of the uterus itself, which must always be done with great reluctance, and only because everything else has been tried. If electricity has not, then everything else has not been tried. And here it is that the question of mortality has been raised. I can scarcely conceive that the mortality attending this new method of treatment can ever be compared with even the best operative statistics. Here especially it is necessary to have a full record of the fatal cases, so that one may see how much blame is to be attached to the method and how much to the operator; for several deaths, generally supposed to have been caused by electricity, have, when inquired into closely, turned out to be due either to carelessness or ignorance, or to be merely accidentally associated with the electrical treatment. Thus it becomes important not only to have statistics or results, but also details of cases—the working out of results—so that each one may see and judge for himself.

In the second place, it is clearly indicated as a means of treatment in all cases where the tumour blocks the pelvis, causing pressure symptoms. Here there is nothing—absolutely nothing—that can for a moment compare with the electrical treatment.

Beyond these two classes of fibroids I am unable to proceed. It may be that as the method becomes more fully developed, it will be found useful in other cases. As yet there seems little evidence of this.

Now we pass to another group of cases—cellulitis—for which the constant current seems destined to hold a high place as a remedial measure. Here, again, many (but I do not think most) cases get well with ordinary antiphlogistic treatment. But those that do not, can nothing be done for them? Happily, as these cases show, we have still a powerful means at our disposal in the constant current. I am sorry to say I have not had such a happy result with peritonitic adhesions.

Many other pelvic conditions may be best treated by the constant current. Of these I have not had enough experience to speak with certainty. There would appear, however, to be some cases in which, after ordinary remedies have failed to relieve, the constant current has the desired effect, so that it should always be kept in mind as a possible necessity.

I would like next to make a few remarks about the *method of procedure*, and about the *rationale* of the treatment.

The Method of Procedure.

Into this part of the subject I do not propose fully to enter. It is already sufficiently understood by all. But a few practical points that have cropped up from time to time may be useful.

The intra-uterine applications are nearly always made with a platinum electrode. But for hæmorrhagic cases which are not improving, or where the uterine cavity is expanded, so that the whole mucous membrane may not be cauterized by the platinum, *Apostoli's graduated carbon-pointed electrodes are indispensable.*

For puncture, steel trocars are used. Apostoli lays down the rule—1st, *That punctures should by choice be made when a portion of the tumour presents through the posterior fornix, and always of necessity when it is impossible to pass a sound into the uterus;* 2nd, *That punctures should never be made except through the posterior fornix;* and, 3rd, *The needle should be pushed into the tumour to the extent of only half an inch.* Sometimes I found that there was a distinct cellular deposit round the tumour, and that if by chance the trocar did not pass beyond this, great pain was caused by the application. Generally, a feeling of greater resistance will tell the operator when the tumour is reached; and it should be punctured to the depth of half an inch. These applications are generally negative, but may be positive if the negative ones are too painful.

Sometimes—as when we wish to cause the absorption of an exudation—the internal electrode is in the vagina, and not intra-uterine. In this case its end is covered with cotton wool, to prevent cauterization of the vaginal mucous membrane. As it is, care must be taken not to use too high an intensity—50 mà. or less is quite sufficient—lest a shrinking and corrugation of the mucous membrane result. The vaginal electrode is generally made negative; but it is the effect of the interpolar current which is desired.

Punctures, as a matter of precaution, are better made not oftener than once a week, by which time the previous wound is almost healed. Some puncture oftener, but I think it is attended with risk. Other applications may be made about five times in the fortnight.

With regard to the flat inactive abdominal electrode, which Apostoli still makes of sculptor's clay covered with tarlatan, I have made use of a form originally devised by Engelman of St

Louis, viz., a plate of perforated zinc alloy, on which is quilted, about an inch thick, ordinary absorbent cotton. This is steeped in a warm, weak saline solution, and wrung dry just before application. Engelman advised that no salt should be put in the water, but this is a mistake. This form of electrode, like many others, is quite as good as the clay one, and far less disagreeable to the patient, as it is warm and clean.

Antiseptic douches should be used before and after each application.

I did not find a rheostat necessary, as the patients were quite able to bear the addition of one cell at a time.

It is well also to remember the caution with which all external measurements should be accepted as an indication of the size of a tumour. They must always be combined with bimanual examination.

So, too, measurements of the uterine cavity with the sound are apt to be very fallacious, and, alone, cannot be taken as evidence of the size of the uterine mass. This is owing to the great difficulty often experienced in passing the sound the whole way. It is a point also referred to by Dr Keith.

No great knowledge of electricity is required in making these applications. Of course, an acquaintance with the elements of electricity is necessary. Ability to make an accurate diagnosis, the requisite manual dexterity, such as is required for ordinary gynæcological manipulations, and a knowledge of what the electrical current is capable of doing, so that the proper kind of application may be made in each particular instance—these are absolutely essential.

Danger.

The alleged danger of these applications I have not seen. With ordinary care, and with antiseptic precautions, there appears to me to be no danger whatever. Some cases may require to remain in bed during the treatment, but the great majority can come for applications, and after resting for an hour or so walk home with little or no inconvenience. Some of my cases came regularly a two or three hours' journey by train, and went home again after each application.

Septicæmia, as a result of puncture, is to be prevented by antiseptic douching, and by making the applications not too frequently.

In one of my cases cellulitis was set up, but, as already mentioned, for this I was entirely to blame, having used the sound without sufficient care and gentleness.

Certain minor effects are frequently caused by the applications. These are—

1. *Headache*, which commonly lasts for two or three hours. It is relieved by 10 grain doses of antipyrin. Dr Keith uses iodide of potassium.

2. *A feeling of bodily weariness and lassitude,* which soon passes off, giving place next day to a feeling of greater well-being than before, as a rule.

3. *A bloody discharge is often set up* by the introduction of the intra-uterine electrode. This soon stops, but may be followed for a day or two by a dirty-grayish, semi-bloody flux. And in bleeding fibroids, it may be that, for the first week or two of treatment, the flow is increased, so that one might give it up in despair, concluding that it had actually increased the hæmorrhage, whereas if the applications be continued a little longer it soon stops. This is of great importance, and should be borne in mind.

4. *Pain in the abdomen,* and especially over the fibroid, apparently due to a slight inflammation in the tumour, is not uncommon. It usually subsides in the course of twenty-four hours, and requires no treatment. A fresh application should not be made until it has entirely ceased.

5. It is generally supposed that a *sudden breaking of the current* is very disastrous. Twice, accidentally, it was broken at 200 mà., and once at 250 mà., but, beyond causing a slight shock, did no harm.

6. *Hæmorrhage may follow punctures.* This is easily arrested by hot douches or packing. It is to be avoided by puncturing through the posterior fornix only, and by feeling first with the tip of the finger to make sure that no vessel pulsates at the spot selected.

Rationale.

While originally intending to steer clear of this subject, as it can only be a matter of speculation, I hope, nevertheless, to keep still within the sphere of observation and fact, by simply trying to interpret some of the results.

It is generally admitted that the effects of the constant current may be divided into two groups: first, that due to the passage of the current between the two poles, the inter-polar effect; and, second, that due to the localized action of the active internal pole, according as it is negative or positive. The difficulty commences when an attempt is made to explain these effects. Turn for a moment to each of the categories of cases, and see how the facts correspond with the statements made.

Firstly, *the Bleeding Fibroids.*—Here, unquestionably, I can confirm the statement that the positive metallic electrode in utero has the power of arresting hæmorrhage. It is clearly hæmostatic, as every one is agreed. But Cases I. and X., in which hæmorrhage was greatly diminished by negative puncture, show that the inter-polar current may also be able to arrest hæmorrhage.

Secondly, *Relief of Pressure Symptoms.*—This apparently can be accounted for by the diminution in size of the tumour mass, which

is a constant accompaniment. How this diminution occurs will be seen presently.

Thirdly, *the negative metallic pole* in utero does tend to increase the amount of blood lost at the periods, but this effect, in many cases, has been only temporary, I think, and at any rate has made little difference in the dysmenorrhœa.

Fourthly, *How does Diminution in Size of the Tumour occur?*—This is *the* question which has excited most discussion and speculation, and is a point that can be satisfactorily determined only by experiment. Whether the electrical current can entirely dissipate a fibroid or not I am unable to say. I have never seen it happen, and Apostoli, with his vast experience, acknowledges its extreme rarity. But *diminution* in the size of the tumour *mass* is an undoubted fact. This is apparently an inter-polar effect entirely, but how it occurs I cannot pretend to say. Eleven of these sixteen cases underwent diminution,—slight, no doubt, but still appreciable. In only one case was it so great that it could not be accounted for partly by the contraction and hardening of the tumour which follow the applications, and which, therefore, leave it harder and slightly smaller than before. As a result of this, also, any nodules near the external surface of the uterus tend to become subperitoneal by being gradually extruded, and those towards the interior become submucous, often pediculated, and may be expelled per vaginam. This, then, is the first factor in the diminution. The second one, which is purely theoretical, is therefore of correspondingly little value. As it is closely allied to the action which takes place in the process of absorption in *cellulitic cases*, let us look at them for a minute.

Lastly, *Cellulitis.*—The inter-polar current is here most probably the sole agent, and it acts, apparently, by stimulating and hastening (but in what way is doubtful) the process of absorption which occurs naturally. This effect is perhaps produced through the medium of the bloodvessels or nerves.

May not a similar process partly account for the diminution of fibroids? Here it is necessary to suppose that the new growth is surrounded by a zone of inflammatory tissue either in the stage of congestion or of exudation, either of which conditions the passage of an electric current will modify, so that a diminution in the bulk of that zone will result, and so the whole mass become smaller.

I am not seeking to deny the possibility of electrolysis occurring in the new growth tissue. It seems, however, very improbable, but direct experiment is the only way either to confirm or disprove it, and such experiment must, on account of its nature, be almost impossible.

What I do wish to point out is this—that the diminution in the size of the tumour in this series of cases is so slight comparatively, that it is not necessary to suppose that any destruction of tumour

tissue has taken place. This may have happened; it is impossible either to prove or disprove it. But if such an explanation as the one I have given is possible and likely, then it will be quite enough to account for all the decrease that has occurred,—except, perhaps, in one case, No. XVI., where the reduction in size was so great as to make this explanation not quite so satisfactory. But even here it is quite possible.

Further, the constant current acts as a *tonic*, so that patients feel much better and stronger, often before any change has occurred in the pelvic condition, either physically or symptomatically.

Then, too, it *relieves pain*, just as happens in other parts of the body. But for this the constant is far inferior to the interrupted current. This is doubtless an action on the nerves.

The communication contains very little that is new or original, being mainly corroborative. It is an honest attempt to record in a fair, unbiassed manner a trial of the new agent which threatens to revolutionize gynæcological practice. If I have succeeded, even in the slightest degree, in adding to the reliable information on the subject, my object is fulfilled.

I have to thank Dr Fordyce for kindly finishing some of the cases when I left Edinburgh, and must record the deep obligation I feel under to Professor Simpson, for whom the work was undertaken, and without whose kind and generous assistance it would have been impossible to accomplish.

Discussion upon this paper was postponed.

MEETING IV.—FEBRUARY 12, 1890.

DR BERRY HART, *President, in the Chair.*

I. *Dr J. D. Williams* showed—(*a.*) A specimen of FOREIGN BODY IN THE POUCH OF DOUGLAS. This was taken from a woman æt. 32, the mother of four children. She was admitted into the Royal Infirmary suffering from swelling of the legs and dropsy of the abdomen in August 1888, and discharged in October. She was readmitted in February 1889, and died a few days after admission of heart disease. During her stay in the Hospital she was tapped four times for abdominal dropsy, and three times by her medical attendant during the interval she was at home. All the