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## ORIGINAL ARTICLES.

### THE TREATMENT OF SALPINGO-OVARITIS BY ELECTRICITY.

*Being a paper prepared for the Gynecological Section of the American Medical Association Meeting at Newport, June 27, 1889.*

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The electrical treatment of fibroma which I originated has made great strides despite the railings of charlatans and incompetent persons; it is not necessary to refer to this subject again, because it is a child that will grow of itself, and is amply able to take care of itself. To-day I invite your attention to a subject of equal interest, I mean the treatment by electricity of salpingo-ovaritis, and I sincerely hope that it may have the same useful future, more restricted perhaps, because at present it is restricted to a certain number of cases, but in any case worthy of your consideration.

Salpingo-ovaritis is a disease which has long been recognized, but under names which I have changed very often: *Phlegmon*, *pelvic-peritonitis*, *lymphangitis*, *adeno-lymphangitis*, *cellulitis*, *peri-metritis*, *para-metritis*, *peri-uterine*, *phlegmasia*, etc.; all of these titles being used to picture a disease originating in the lymphatics, in the cellular tissue, or in the peritoneum, according to the special pathological views of the individual describing the malady. Laparotomy had the advantage of fixing the diagnosis precisely, by demonstrating that lesions of the ovary and of the tube were almost constant factors, and that these inflammations almost always took origin in the lining membrane of the uterus, and from there spread to the adnexa, the cellular tissue, and the peritoneum. At the commencement of my practice I fell into the common pathological error, which I hasten to correct to-day: But one fact is beyond dispute, and that is that the conditions which I then treated as *phlegmon*, and *peri-metritis*, and which concealed a *salpingo-ovaritis*, does not militate in the least against my claim to priority in the electrical handling of the disease under discussion.

Since 1882 I have treated all cases that come to my clinic by electricity, whether suffering from

tumors, from endometritis, or peri-uterine phlegmasia. Look for a moment at the thesis of my assistant, Dr. L. Carlet, which appeared in July, 1884,<sup>1</sup> and which I myself revised thoroughly: "One pole (the negative) is that of *denutrition par excellence*; it is suitable, therefore, not only for tumors, but for sub-acute peri-uterine inflammations (circumscribed), without fever, which are connected with the uterus, and which considerably disturb its functions." Farther on, you may read with profit the clinical histories of twenty cases<sup>2</sup> of peri-uterine phlegmasia, complicating uterine tumors, which were treated with electricity. I quote as follows, (page 110). "This observation is of the greatest importance, because it shows the value of intra-uterine galvano-caustique in moderate doses, in causing a resolution of sub-acute peri-metritis." Further on I wrote: "This observation (page 117) should be of great importance, since it shows, first, that intra-uterine galvano-caustique, badly done, or made unduly painful, may set up multiple accidents, and here, the peri-uterine phlegmasia is clearly due to the last application. On the other hand, this observation also proves, that hysterometry, badly done, is dangerous, but when well done is never so, even in the sub-acute stage of peri-uterine phlegmasia; this same malady, indeed, has been treated with uterine faradization (that is by another form of hysterometry), during the convalescent stage of a phlegmon of the broad ligament, which resulted in a complete cessation of symptoms after a very short treatment."

From 1884 to 1887, my experience has enlarged coincidentally with greater skill, boldness in operating, and at the Dublin Congress (August, 1887), I discussed the question under an entirely new caption. (See *Bulletin général de Thérapeutique*, of September 30, 1887, and *British Medical Journal*, of November 19, 1887). To-day the names have changed, but the ideas are the same, and I propose giving you the results of my electrical treatment. I shall speak no more of *peri-metritis*, but of *salpingo-ovaritis*, whether complicating a pelvic peritonitis or not. The atti-

<sup>1</sup> Du traitement électrique des tumeurs fibreuses de l'utérus d'après la méthode du Dr. Apostoli par le Docteur Lucien Carlet. Paris. Octave Doin, Editeur. 1884.

<sup>2</sup> See observations (op. cit.) on pages 74, 81, 85, 94, 108, 114, 120, 123, 124, 151, 169, 196, 205, 214, 216, 225, 227, 232, 236, 241.

tude of those doctors who occupy different and opposing ground, is very curious, and may, briefly, be described as follows: the large number, following in the footsteps of a wise ancestry, when confronted with a salpingo-ovaritis, exclaim, "Do not touch it." They ignore all intra-uterine interference, relying upon poultices and revulsives. Their success is variable. The cavity of the uterus is, for them, a *noli me tangere*, which they religiously avoid. Others, on the contrary, comprising a small number of surgeons, anxious of statistical fame, open the abdomen of every woman having an undue sensitiveness of the adnexa, either for exploration or castration. Here the abuse cries out for reform, and if, under some circumstances, the services of the surgeon are indispensable, yet here, one may justly exclaim with indignation, that in many cases, surgery, out of selfishness, consigns a woman to a future of sterility. The true path, gentlemen, lies between the two extremes. If, on the one hand, doctors are over-timid, and count too largely upon nature to cure certain diseases, which almost never, are spontaneously cured, on the other hand, surgeons commit a fault quite as reprehensible, by hasty operations; for we know now that castration sometimes kills, and does not always cure, forgetting that, clinically speaking, these cases are frequently curable by more simple and conservative means, without causing an irreparable physical and moral shock to the woman.

From the very commencement, despite the prejudice from all sides, my treatment of these cases has been absolutely and entirely the intra-uterine electric. This idea, at first theoretic, is to day a fixed fact, thanks to pathological investigation which demonstrates that almost all cases of peri-uterine phlegmasia or salpingo-ovaritis, have their starting point in an endometritis, which is often the posthumous witness of the secondary lesion of propagation, cleanse the uterus, make use of intelligent intra-uterine antisepsis, cure the endometritis, and provoke healthy intra-uterine derivation—such are the general considerations that have guided me on to such results. These are the reasons why, at the very first, I swept away the existing prejudices against an interference with the uterine cavity, and why I went at once to the bottom no matter what might be the extent of the phlegmasia. It is true, I associated, in this therapeutics, faradization with galvanic-chemical caustique. Faradization, in the form of a current of tension, calms the nervous system, diminishes excitability and relieves pain; but, of itself, is often insufficient to arrest the acute phlegmasia. The dynamic action in the commencement of inflammatory conditions is purely calmative, and will aid in the resolution of old exudates. I have associated three orders, of procedure, which, in inverse order of merit, are faradism, intra-uterine galvanism and vaginal

peripheric galvano-puncture. I will briefly sum up my views of each.

1. Faradization, under the form of a current of tension, made by the long thin wire, calms the nervous system, moderates its excitability, assuages or cures pain, but is often powerless to arrest an acute phlegmasia; its action is purely dynamic, and it acts, as opium acts, during early inflammatory stages, but is powerless to arrest the evolution of inflammatory processes. The current (faradic) of tension is the only one tolerable and indicated in acute and subacute forms. A current of quantity is less efficacious and less tolerable, except in rare cases of chronic exudates where, in acting upon the interstitial circulation, it aids reabsorption to a certain extent. The electrode should generally be the bipolar, to better localize the electric action, either in the vagina or in the uterus. All other things being equal, the uterine application is by far the most useful. The application should be in moderate doses without shock, and more gentle as the inflammation is more active. The séances should be daily at first, lasting from five to twenty minutes, and the dose progressively augmented as the patient can bear it.

2. Galvanization, or rather intra-uterine chemical caustique, is much more powerful than faradization, and will often be sufficient of itself in cases of ovaro-salpingitis. It is a most excellent way of changing in part or in whole the entire lining membrane of the uterus, and of setting up peripheric changes by derivation. The faradic current excites the nervous and muscular systems after the manner of a mechanical force, by interruptions and shocks. The galvanic current, however, is a physical and chemical force, at once caloric and trophic, and brings each of its factors into action separately or together as desired. All binary compounds and those of greater complication will tend to decomposition, and this decomposition, called electrolysis, will be in proportion to the electric energy given out, and to the length of time of the application. This interstitial breaking up of the elements, which will be preceded by a different orientation in the polarization of the organic molecules, tends, on the one hand, to bring around the positive pole the acids and oxygen, while the bases and hydrogen go to the negative pole. This serious molecular action ought to be sufficient for an intelligent theory of the effects of the galvanic current, but recent experiments which we have made place these facts upon an indisputable basis. My friend Laguerrière and myself have found that the galvanic current sent through culture media of pathogenic microbes is *germicidal*, thus confirming what I said long ago, that this current was *antiseptic*, and would *attenuate* or *sterilize* certain conditions of germ change. Applied in a given region the galvanic current acts locally and generally; each

pole has its undivided caustic action—the one acid, the other basic. The current is felt in the interpolar zone, engendering trophic changes, and tending to the resolution of certain pathological conditions.

The doctor of to-day who has not kept apace with the advance of gynecological science, lauds to his utmost the curette, which first saw the light in France, but has long since fallen into desuetude in the land that originated it. Without wishing to discredit a surgical procedure of value in certain conditions, the superior advantages of the intra-uterine galvanic current are beyond dispute.

(a.) It is simple and easy of application, requiring no assistant, and may be used by any one, no matter how little experience he has in gynecology.

(b.) Being but slightly painful, chloroform is not needed, this being only demanded in certain cases of puncture.

(c.) It is valuable among working women, as a short period of repose alone is necessary after the application, instead of hours and perhaps days in bed.

(d.) It can be gradually and gently applied by progressively increasing the strength, and is less brutal than the curette.

(e.) It is not contraindicated in any acute case of inflammation—the sole caution being to use extra care, and to increase the strength only as the patient is able to bear it.

(f.) It is an agent which, instead of being blind, obeys in a precise and mathematical manner the hand applying it; that is to say, one can measure and administer it and at the same time have an exact record of the amount of cauterization produced, to which three things conduce: the general intensity made use of, the density of the active electrode, and the duration of the application.

(g.) It is an active force, which will produce an active result localizable at will, and which may be concentrated upon any part of the uterine lining membrane desired.

(h.) It is absolutely harmless if proper antiseptic or aseptic precautions are made use of.

(i.) According to the intensity and duration its action can be varied, and also according to the active pole made use of; it may be made acid by using the positive pole, and basic by using the negative pole.

(j.) Apart from the curetting action of the chemical galvanism, which one can easily see, there is a more profound action trophic and vital, and which is propagated along the whole organic circuit between the two poles. Thanks to this last consideration, above all in the treatment of salpingo-ovaritis, this chemical galvanism has a power far above surgical curetting, chiefly in reaching the uterine parenchyma and adnexa.

(k.) If surgical *râclage* often results in frequent

returns of the disease, causing anatomical and functional troubles which it hoped to combat, I can affirm that these results are much less frequent by the electrolytic treatment, which may require several sances to produce a lasting effect, but which good results, as I have had reason to observe in my clinic, last for many years after the cessation of all treatment.

The operative technique is already sufficiently well explained in my various brochures upon the electric treatment of fibroma and endometritis. I shall content myself with giving you merely the salient features of the treatment of ovaro-salpingitis. The positive pole always causes less congestion than the negative, but the latter is more valuable to promote resolution. The positive pole should be used generally in the commencement, and once having passed the first stage of toleration, the negative pole should be substituted. The dominant preoccupation which should make us cautious in treating salpingo-ovaritis, and which is sometimes difficult of recognition, is the fear of finding ourselves in the presence of a pyosalpinx, which a large dose of galvanism would aggravate; so, when in doubt, begin very gently with a mild current to test the susceptibility of the uterus and peri-uterine tissues, then increase with the patient's tolerance and according to clinical indications. One may begin with 20 to 40 milliamperes. If the intolerance is great, respect it and do not increase; if well tolerated increase to 100–150 milliamperes. Here clinical diagnosis must be called in to differentiate between hysterical intolerance, that need not be heeded, and an inflammatory intolerance which must be respected. The sittings should not be too frequent. In the initial treatments they are frequently followed with a reaction more or less intense, which may last several days; generally we should wait until calm is reestablished. Sometimes the sances may be given once or twice a week, sometimes only every fifteen days. The same reasons must guide the doctor as to the length of a sance; sometimes they should last three minutes and sometimes five to eight minutes.

3. I now come to the third division, the most efficacious of all, the penetration with the galvanic current of one of the vaginal cul-de-sacs at the nearest point of the inflamed region. I mean *vaginal galvano-puncture*. There are two clinical indications, the one of *choice*, the other of *necessity*. The indication of choice presents itself when one finds himself in presence of a salpingo-ovaritis which has not been sufficiently ameliorated by the intra-uterine galvanism. It is necessary then to penetrate the mass in the point the nearest possible to the diseased spot, in order to lose nothing of electric force, which now should seriously concern itself with the suffering point. Theoretically the application, well made, should be most efficacious, and no doubt rests in my mind that such is

the case, for the reply of all the patients who have submitted to this plan is that the punctures were much more painful but much more efficacious, because often one puncture gives more relief than many simple intra-uterine applications. The indication of *necessity* for galvano-puncture is when a fluctuating tumor impinges upon the vagina, and which should be drained antiseptically through the vagina.

Already many years ago I gave the rules for the essentials of galvano-puncture. I will only now cite the chief points:

(a.) Here, as in all electrical treatment, be it faradic or galvanic, one should precede everything with thorough antiseptics, preceding and following every operation with an antiseptic vaginal irrigation, either of sublimate, carbolic acid, creoline or naphthol. Between the séances we will do well to close the vaginal cavity with iodoform gauze (or sublimate or salol gauze), to insure perfect asepsis, as well as to prevent sexual congress, which should be suspended.

(b.) With the preceding electrical treatment it is not necessary to remain in bed. I exact from my patients only one or two hours of repose after galvano-caustique, without denying, however, that a longer period might be beneficial. Galvano-puncture, however, requires at least two or three days of rest in bed after each puncture.

(c.) The trocar carrying the current should be the smallest possible, but of sufficient resistance not to be easily broken. Steel is the best, because it penetrates easily.

(d.) The chief point is the depth of the puncture. A slight puncture of a *half centimetre*, as an average, suffices to make a door of entrance for the current in the region which it is to traverse. Deeper punctures do not suffice any better to attain such an end; on the contrary, as I have seen, they may be dangerous. I proscribe all punctures over 1 centimetre.

(e.) Where make the puncture? Questions of choice and necessity here come up. The choice is to puncture as near as possible the diseased portion, but necessity forces us to avoid at all cost the anterior cul-de-sac on account of the bladder. The lateral, and above all the posterior regions are the most favorable for the puncture. I make them oftenest in the posterior cul-de-sac, in the middle of the pouch of Douglas, directing the axis of the instrument toward the uterus in order to avoid the rectum.

(f.) This operation, much more painful than galvano-caustique, is often tolerated by certain women, but in others chloroform will be required.

(g.) I *never use a speculum* in this operation, which can only be well and delicately carried out as follows: One fixes at first the exact length of the puncture, by turning the screw and advancing the steel point to the required length beyond the celluloid, then, having fixed with the index finger

the exact point to be punctured, and having made sure that there is no arterial pulsation, one slides the celluloid up to the point, which serves as the conductor for the trocar, which is then plunged in.

(h.) The number of punctures demanded is variable. Some cases of hydro- and catarrhal salpingitis yield to one puncture, some require three or four, and tubercular tubes even more.

Generally these cases require much longer periods of intermediate repose than cases of galvano-caustique, because at their commencement they are often followed by a severe reaction, which may last many days. The application should not be renewed until all of the symptoms have disappeared.

(i.) As to intensity and choice of poles I repeat what I said just now when speaking of intra-uterine galvanization. The intensity will vary from 20 to 50 milliampères. To go beyond this is to go beyond the point of tolerance, and chloroform should be used. To create a temporary vaginal fistula 100 to 250 milliampères will be required.

(j.) The puncture should generally be positive at first, because it is more tolerable and less exciting than the negative. This latter is employed when a more powerful action is demanded. Especially in presence of a fluctuating tumor pointing into the vagina, in which a fistulous tract is to be made and vaginal drainage established, is the negative pole demanded.

(k.) Should febrile excitement arise, all treatment is to be suspended. One may think himself in the presence of a pyosalpinx, if it points into the vagina, and a puncture is not contraindicated; but if it is high up, not accessible, and far from the vaginal cul-de-sac, a deep puncture, which might cause an evacuation into the cavity of the peritoneum of the sac, is to be avoided. It is here that surgery must step in to carry out its legitimate functions.

My clinical experience, which is now seven years old, has given me many cases of salpingo-ovaritis, which I hope later on to tabulate. I shall content myself now with some results of my treatment. Every salpingo-ovaritis will generally be suitable for appropriate electrical treatment, and this should be the conservative method of choice; it is sovereign in catarrhal salpingitis, only calmative in tubercular salpingo-ovaritis, and in certain pus tubes may be of great service. Whatever electric treatment is made use of, it should be continued until the patient pronounces herself cured of her symptoms, and until an examination has satisfied us that the anatomical change is considerable. Surgical interference should never be resorted to until after all electrical resources have been exhausted. Castration, which morally and physically mutilates a woman after an incurable fashion, and only cures radically in a fourth

or fifth part of the cases, should be only an operation of necessity, never of choice, and should be regarded as a last resort. Electrical conservative therapeutics, harmless, easily applied by any one, and which does not pretend to cure every case of salpingo-ovaritis, finds its greatest triumph in rendering a *subsequent conception* possible, as I have seen in several of my patients. I will not harrass you with the details of all of the cases that have been to me for treatment, but will content myself with giving you full details of two typical cases, in one of which there were two subsequent conceptions, the other remarkable clinically, and though long it is full of interest, demonstrating that electricity, persisted in and rightly used, may be of the greatest value in the different troubles that may beset the same patient.

#### COMPLETE HISTORY.

Madame Sophie Edinger, æt. 34 years, living at 5 Rue de l'aqueduc, Paris, presented herself at the clinic of Dr. Apostoli, August 17, 1886.

*Previous History.*—Nullipara, neither pregnancy nor miscarriage. Born in Lorraine. Has lived at Paris for seventeen and a half years. Mother died at the age of 48 in consequence of a profuse uterine hæmorrhage, the cause of which was unknown. Menstruation easily established at the age of 11. Since its appearance it has been of the following regular type: Occurring at fixed intervals, the flow has lasted on an average six days, and has been *painless*; it has always been *very* abundant, and often accompanied by the expulsion of clots. At 13 and at 17 years of age, without an appreciable cause, the periods were suppressed for about two or three months, without other morbid phenomena. Slight, intermittent leucorrhœa.

Of a rather delicate and lymphatic temperament, the patient had several of the diseases of childhood, eczema of the head, and frequent attacks of gastritis which often caused vomiting of the food. At 28, a light attack of rheumatism, localized in the two arms, which lasted one week.

Married at 29 years of age. From the beginning of her marriage her health has been disordered. The most striking phenomena from the first were the menstrual troubles characterized by an increase in the quantity of the flow, by its more frequent occurrence, and by pain preceding the flow for one or two days and disappearing as soon as it was established. Her married life, then, was marked for five years by the appearance of a *true dysmenorrhœa*, very intense, which has persisted until to-day, and which often obliged her to go to bed. Usually the pain disappeared suddenly on the appearance of the flow.

Since her marriage her general health has also been disordered; she began to grow thin, and her appetite became capricious. This condition persisted for three years, during which time she

worked, though with difficulty. For two years past (1884-1886) her condition has become progressively much worse. The pain, formerly intermittent and premenstrual, has become almost constant, interfering with the walk, making standing impossible, and localizing itself as a continuous dragging or tension in the right iliac region, radiating posteriorly to the lumbar region, and anteriorly to the right groin, involving further the entire corresponding thigh as far as the knee. This pain has increased greatly, without changing the condition topographically, at the time of the periods most of all, obliging the patient to take a forced rest.

For some months after the marriage the sexual relations were very painful. Then the pain disappeared, to reappear again two years ago with much greater intensity, finally making all sexual relations impossible. Intercourse also provoked and increased the pain in the right iliac region. The patient has never, up to this time (1886), had any pain in the *left* iliac region. *For eight months the patient scarcely left her bed*, attacked by pain so intense as to cause her to cry out involuntarily; this was accompanied by almost daily vomiting of sometimes alimentary, sometimes bilious matter. She grew thin more rapidly and her appetite became more and more perverted, while the digestion became more painful. The abdomen was extremely sensitive, and the pain was always localized on the right.

She was also decidedly constipated. The menstruation was at times transformed into a veritable metrorrhagia, an almost constant flow with an interval of only one week between the periods.

The patient was treated regularly by Dr. Mandet, who applied the usual classic treatment of emollients, milk *régime*, opiates, revulsives upon the abdomen, etc. It was at the instance of her physician that she came to consult us, on account of the total lack of success of the most varied and assiduous treatment that had been instituted.

*Actual Condition August 17, 1886.*—The patient is humble, impressionable, nervous, but not hysterical, so feeble, and suffering to such a degree, that she had to be brought to the clinic in a carriage and assisted upstairs. She is emaciated, without color, and exhibits a state of considerable suffering. On palpation the abdomen is painful, and sensitive in the two iliac fossæ, especially in the right. For a year it has been impossible for her to remain erect without an abdominal support.

The internal examination is difficult on account of an excessive sensibility of the uterus, and especially of the cul-de-sac. An inflammatory exudate entirely surrounding the uterus constitutes a single mass, adherent to the sacrum, to each side of the pelvis, and enclosing the uterus.

An examination shows at times in the middle of this total cellulitis, which envelops the uterus, a plane, subadjacent, more resistant and fibrous,

which indicates the presence of an interstitial uterine fibroid, localized especially at the right and anteriorly.

*Diagnosis.*—Peri-uterine and subacute inflammation with interstitial, subadjacent fibroid, and ovarian salpingitis. Pronounced retroversion. Sound measures 7 centimetres.

*Treatment.*—August 21, 1886. *First, intra-uterine negative galvano-caustic, 100 milliampères, for five minutes.* Two hours after the treatment the patient returned home.

September 9, 1886.—Patient reports that she has had a flow lasting twelve days, which began the day after the first treatment, and which has greatly fatigued her. This flow is probably due to the first operation (treatment), which was wrong. This was *negative* and ought to have been *positive*. This flow was accompanied by an increase in the vomiting already existing. In order to calm the patient, she was given an *intra-uterine, bi-polar faradization of tension, with the fine wire, for five minutes*, and starting with to-day, in order, hereafter, to carry on this treatment simultaneously with the treatment of the uterus, the *bi-polar galvanization of the pneumo-gastrics was begun*, to alleviate the gastric phenomena, the most serious of which is the vomiting.

This galvanization is given at a dose of 5 to 12 milliampères, for five to fifteen minutes each time.

September 21.—*First positive, intra-uterine galvano-caustic* (made with the object of arresting the hæmorrhage), 175 milliampères, five minutes.

Sept. 30.—*Second positive galvano-caustic.*

Sept. 30.—*Third positive galvano-caustic—idem—150°, five minutes.*

The last period occurred Sept. 22, and lasted six days. The vomiting of food, which was incessant, and almost daily before the beginning of the treatment, has been overcome at the onset by the galvanization of the pneumo-gastrics, which has not only put her in a condition to tolerate the milk which she had been ordered to take, at the clinic, but also has again given her an appetite, almost unknown before.

October 7.—*Re-commencement of the negative galvano-caustic in order to accelerate the absorption of the exudate.* Second negative galvano-caustic, 80°, five minutes.

October 12.—*Third negative galvano-caustic, 80°, three minutes.*

It was necessary to discontinue the treatment after a sitting of three minutes, on account of the *mal au cœur* of which the patient complained. Strength is restored, the stomach performs its functions much better. Since the beginning of the treatment she has never vomited on the days of treatment, and in the intervals has vomited but rarely. For fourteen days there has been entire absence of vomiting. She begins to walk more easily, and with less pain, but still suffers when sitting. The constipation persists. She has con-

stant numbness in the right leg. She is still obliged to keep her bed almost all the time, and only leaves it to come to the clinic.

October 14.—*Fourth negative galvano-caustic, 100°, five minutes.*

October 19.—*Fifth negative galvano-caustic, 100°, five minutes.*

Has had her menstrual period since this morning, but with much less pain. The complexion is clearer and the expression better.

October 21.—*Menstruation continues; flow abundant, but there is no menorrhagia.*

October 26.—*Vomiting again on the 23d and 24th.* Fifth negative galvano-caustic, 100°, five minutes.

November 4.—*Sixth negative galvano-caustic, 150°, five minutes, badly borne.*

November 6.—*Seventh negative-galvano caustic, 60°, five minutes.*

November 9.—*Eighth negative-galvano caustic, 60°, five minutes.*

The vomiting has quite ceased; only a slight nausea remains. The appetite and digestion are always better on the days of treatment; the day following she is sometimes not quite as well. There is an equal improvement on the part of the abdomen; it is less sensitive on pressure, and swells only when she is tired from walking. For fifteen days she has been able to sit up part of the day.

November 11.—Patient is menstruating and (a fact most characteristic in favor of her improvement) she has suffered much less than usual, and has not had to go to bed. She has been able to walk alone without support, a thing which formerly was impossible in this condition. She declares herself completely transformed.

November 11. Eighth galvano-negative, 90°, five minutes. An internal examination shows an appreciable change. The half of the exudate has disappeared, and on the right it has left bare the sub-adjacent fibroid, the diagnosis of which is emphasized to-day. The uterus begins to be movable, and can be slightly displaced.

November 20.—*Ninth galvano-negative, 100°, five minutes.*

November 27.—*Tenth galvano-negative, 80°, five minutes.* Since the beginning, each treatment is followed by an antiseptic vaginal injection, after the method of Van Swieten, and a tampon of iodoform gauze is left in the vagina.

November 30.—Patient has just had a return of her former painful symptoms, without an appreciable cause. This lasted eight days, and was marked by a reappearance of the old vomiting. Galvanization of the pneumo-gastrics, which produced immediate relief. The weight is increasing; without the clothing it is 118 pounds.

December 2.—*Amelioration of the abdominal pain.* No vomiting since November 30. Eleventh galvano-negative, 80°, five minutes.

December 4.—Twelfth galvano-negative, 60°, five minutes. The patient is becoming more intolerant of the action of the galvano-caustics, but each time she feels greatly relieved by it, and sleeps better the night following.

December 23.—Thirteenth galvano-negative, 80°, five minutes. Patient feels well. The gastric troubles have disappeared; she walks better, but is still unable to do her housework.

December 28.—On account of the intolerance which begins to be manifested for the galvano-caustic which, at the beginning, was well borne at 100°, and now is somewhat painful at 60° or 80°, and in order to hasten the cure—which may be considered as still in the rough—both anatomically and symptomatically, the galvano-punctures are begun.

First vaginal negative galvano-puncture at a depth of one centimetre in the right-lateral cul-de-sac, with a filiform trocar of steel, at 200° milliamperes, five minutes. Patient under the influence of chloroform. Vaginal injection of sublimate solution 1-1200 before and after the séance, vaginal tampon of iodoform gauze. Patient remained at the clinic for six days without leaving her bed. Vomiting appeared the evening of the day she was treated and the following day, and was relieved by the galvanization of the pneumogastrics.

Menstruation occurred December 31, ten or twelve days in advance, of average quantity, though rather less than formerly. For the first time since her marriage the menses appeared *without pain* and without the formation of clots. A complete calm has followed the appearance of the menses. The patient has eaten with a good appetite and has recovered her power to sleep, which she had lost for a long time. In a word, she feels as if she were transformed, and she seems to have derived more benefit from this first puncture than from all the preceding galvano-caustics.

January 4, 1887.—The patient left the clinic to return home. Since then her health has constantly improved. The following is a statement of the typical modifications which have been progressively determined from the 4th to the 22d of January, 1887:

1. Walking has become much easier. The patient is able to come to the clinic without the companion hitherto necessary. She is much less fatigued than formerly by the jolting of the carriage.

2. She is able now, for the first time, to do her housework, discontinued eighteen months ago.

3. Digestive functions good. She has more appetite, while the nausea and vomiting have ceased.

4. Parallel transformation, anatomically speaking. On examination the peri-uterine sensibility is less acute. The retrogression of the exudate makes rapid progress.

5. Restoration of all the functions, and notably considerable diminution of the abdominal pain.

Every two days she has had an antiseptic vaginal injection, and the tampon of iodoform gauze has been changed.

January 22.—Second negative, vaginal galvano-puncture, to the right, at a depth of 1½ centimetres; made this time without chloroform. The pain limits the intensity to 50 milliamperes, eight minutes. The patient did not remain at the clinic but returned home the same evening. Slept well and did not suffer. The menses appeared the next day, five days in advance, and for the second time without pain and less profuse.

January 25.—Antiseptic vaginal injection.

January 29.—Walking is still easier, patient finds herself "very light."

February 10.—The orifice made by the last puncture is closed. Third negative, vaginal galvano-puncture, at a depth of one centimetre, 60°, five minutes, without chloroform. Antiseptic injection, and vaginal tampon of iodoform gauze.

February 12.—Patient suffered for some hours after the last puncture, although she was able to go home that evening. She was rather more tired than after the previous punctures, and attributed this to the fact that the operation was done without chloroform.

February 15.—For the first time in eighteen months the patient has had sexual intercourse, which was effected without too much pain.

March 5.—Galvano-puncture without chloroform was attempted. Patient was unable to tolerate it, and after some seconds the application was discontinued. Nausea and efforts to vomit rendered the continuation impossible and unbearable.

March 8.—The evening following this aborted puncture there was a recurrence of the abdominal pain. The next day, March 6, menstruation began, for the first time in her life eight days late. Unlike the three last periods, the flow has been more abundant, painful, and accompanied by the expulsion of clots. The question arises, in view of the recent sexual relation and of the delay in the menstrual function, so abnormal, if this, as seems probable, was not a miscarriage? There was also a renewal of the digestive disturbance, but without vomiting.

March 19.—Fourth negative galvano-puncture, in the posterior cul-de-sac, under chloroform, 150°, five minutes.

March 22.—Patient remained in bed at the clinic 24 hours. She suffered a little after this puncture, but found herself again very much improved. From this date the patient, who has had three times a week antiseptic vaginal injections, and tampons of iodoform gauze, finds herself again progressively improved. One month after, the orifice made by the puncture had not closed. The uterus begins to be easily movable.



April 20.—For the first time in years the pain seated in the plane of the right iliac bone, and radiating posteriorly and anteriorly, has disappeared. Continued anatomical improvement.

May 3.—On examination the fibroid appears to-day very clearly marked, and the inflammatory exudate can only be perceived on deep pressure. The mobility of the uterus increases. Fifth galvano-puncture (negative) in the right lateral cul-de-sac, at a depth of one centimetre, 150°, five minutes, under chloroform.

May 5.—Patient vomited the evening of the treatment and the day following, due probably to the great amount of chloroform absorbed. She remained 24 hours at the clinic. Since the puncture the amelioration has been on the increase. Patient has continued to come to the clinic three times a week for the galvanization of the pneumo-gastrics, and to have the iodoform tampons changed.

June 4.—The following is a statement of the actual condition :

1. Patient has just taken a long walk without fatigue.
2. All spontaneous pain in the right groin has disappeared.
3. Menstruation in April and in May occurred, after a delay of two to four days, *without pain, and less profuse*, lasting five to six days. Slight *malaise* at the end of the periods.
4. The complexion is better, she has more color, and has lost the former deathly hue.
5. She feels transformed, strength recovered, and says she is able to work.
6. The constipation has disappeared. Patient has a daily movement of the bowels.
7. The patient, comparing the benefit from the galvano-caustics with that from the punctures, affirms that the benefit from the latter is very much greater, especially from the punctures made under chloroform, at a higher dose, which proves that the effect increases with the intensity, other things being equal.
8. Patient has never been as well as at present since her marriage.
9. The sexual relation is not very painful.
10. From an anatomical point of view the exudate has been reduced three-fifths. The patient remains under observation, and it is probable that no new interference will be necessary, since she believes herself nearly well from every point of view, and capable of leading the active life of a tradeswoman.

June 7.—Patient weighs 119 pounds. (In December she weighed 118 pounds.) Dr. Apostoli made a futile attempt to pass the sound. This was painful and could not be completed. In the evening the patient had a bloody discharge, which was certainly provoked by the attempt to pass the sound. This discharge continued almost without interruption from the 8th to the 16th of

June; it was neither accompanied nor preceded by abdominal pain.

June 18.—The discharge has been arrested since the 16th, since which time there has been an offensive return of the pain in the right iliac fossa.

June 21.—The old gastric disturbance reappeared the day before yesterday; the patient vomited, and was obliged to come to the clinic for the galvanization of the pneumo-gastrics. Walking is again difficult, and the countenance is once more depressed in consequence of the relapse, which can only be attributed to the sound. With the single object of calming the patient, a first vaginal faradization was immediately given, using the large bi-polar vaginal sound, the extremity of which was applied against the right lateral cul-de-sac, the most painful part. Application of a *current of tension, with the fine wire, with slight intensity, for fifteen minutes.*

The acute pain disappeared immediately after the treatment, the expression became better, and walking easier. Patient continued to be relieved during the evening and somewhat the next day: on the third day there was an offensive return of the old symptoms.

June 23.—Third vaginal faradization, identical with the first, lasting ten minutes, with the same amount of relief.

June 24.—Third faradization, ten minutes.

June 25.—Fourth faradization, ten minutes. Since the 22d the amelioration of the pain has been progressive, and parallel with this the gastric trouble, which always occurs with the pain, has been relieved. The patient has not vomited, indeed, since the 22d; the digestive functions are re-established, walking is easy, and sleep good.

June 30.—In order to bring about the complete resolution of the remainder of the old exudate, a sixth negative, vaginal galvano-puncture was made to-day, *to the right posteriorly*, in the most prominent portion of the fibroid, 180°, five minutes. Depth of puncture, one centimetre. Patient chloroformed. Remained at the clinic 24 hours without any incident worthy of note, and returned to her home the next day.

July 2.—No loss of blood. Patient suffered very little after the puncture. She had a little nausea, but did not vomit. Antiseptic vaginal injections, and tampons continued.

July 12. Menstruation continued from the 4th to the 7th, moderate in quantity, without clots, and without pain either before or during the flow. Since the cessation of the menses the patient has suffered for three days, and has had a return of the gastric trouble. The abdominal pain is better to-day. *Intra-uterine faradization*, with the fine wire, for *five minutes*, badly borne. Galvanization of the pneumo-gastrics continued.

From July 19 to August 20 the patient continued her visits to the clinic regularly three times



a week. *Bi-polar vaginal faradizations with the fine wire* have sufficed for treatment. Thus she has had *seven successive sittings of five to eight minutes each*, the result of all of which has been to increase progressively her *bien-être*, and to relieve all abdominal pain. One month after the last puncture the orifice made by it had not closed, but the patient was able to continue her occupation, in spite of the presence of a temporary vaginal fistula, thanks to the antiseptic precautions which have been carefully observed. Conjointly with the vaginal treatment the galvanization of the pneumo-gastrics has been carried on, according to the indications and, as usual, each séance has been followed by an immediate alleviation of all the gastric disturbances.

October 16, 1887.—Patient has been so well that she suspended her visits to the clinic after the 28th of August. She walks easily, does not suffer, and has no pain during sexual intercourse. Her sleep is good, she eats well, and digests easily. The abdomen is no longer painful, even when she is tired. She is scarcely sensible of a slight dragging the first day of her menstrual periods. Total absence of leucorrhœa.

January 12, 1888.—Excellent health since the last visit. Patient has worked constantly and been able to do really hard work since October, and this without interruption during her periods, which last on an average six days. On palpation, one finds absolute insensibility of the abdomen. On internal examination, the uterus is found to be movable, the peri-uterine exudate is almost entirely absorbed, and there is marked diminution of all sensibility, even with deep pressure.

January 26, 1888.—Same good condition. The journeys which she is constantly obliged to take, even during menstruation, do not fatigue her.

April 16, 1889.—Of her own accord the patient has discontinued all visits to the clinic since January, 1888. She comes to-day by special request. Her health has remained perfect in every particular, and she believes herself radically cured, because all the functions are normal. She has not been indisposed for a single day, and has continued her fatiguing work without interruption.

*Actual Condition, April 16, 1889.*—Complexion fresh and of good color, giving every evidence of health. Walking very easy. Erect position not at all painful. Menstruation is always regular. It occurs on a fixed day, without delay. The quantity diminishes progressively. Formerly the flow continued six days, at present it lasts but three or four days. There are no clots. *There is complete absence of pre-menstrual dysmenorrhœa.* She feels only a little tired, and slight abdominal pain before the appearance of the flow. She is always able, even during her menstruation, to work easily and without fatigue. Vesical functions normal; no constipation; complete absence

of leucorrhœa; sexual relations are rather painful. *Palpation*; the two iliac fossæ are not at all painful.

*Internal Examination.*—Neck in normal position. Uterus movable, without appreciable sensibility. Absence of pain on touching the cul-de-sac, but a deep exploration causes rather acute pain in Douglas' pouch, very little laterally. The uterus is easily displaced laterally, but on raising it it is found to be slightly adherent to the sacrum.

With a deep touch the right ovary can be felt, also the right Fallopian tube, which no longer seems to be inflamed. The rectal examination confirms what has been determined by vaginal examination. All efforts to pass the sound—even a very small sound—are futile. The sound is arrested by an almost complete atresia of the external orifice.

*Nota Bene.*—This absence of dysmenorrhœa, which is coincident with a considerable degree of uterine atresia, is a new fact, which, with the addition of those which I already possess (in all a very large number) stands in favor of the thesis which I have sustained for a long time, the frequent independence of dysmenorrhœa, and uterine atresia, and confirms this proposition: *Dysmenorrhœa is almost always of ovarian origin, very rarely of uterine origin.* The patient affirms again to-day that, judging without appeal, the respective results of the different treatments that she has undergone, she has derived the greatest benefit from the galvano-punctures, although more painful and often scarcely to be endured without chloroform.

In order to get all possible information on the origin of the disease, I saw the husband to-day (April 23, 1889), for the first time, who stated that he had, in 1878, while in the army, a manifest gonorrhœa, characterized by pain on urination, and a discharge *sui generis*. He claimed to have been rapidly cured of this disease by the usual treatment. Five years after this he married, and it is possible that in spite of his statement he had still, at this date, an unknown gonorrhœa, which must have been the point of departure, as is usual, of the peri-uterine accidents of his wife.

#### SECOND OBSERVATION; SUMMARY.

Madame Marie Elien, domestic, aged 22 years, presents herself at the clinic of Dr. Apostoli June 9, 1885; unipara.

*Antecedents.*—No hereditary antecedents, habitual good health, no diseases of infancy, menstruated at 17 years of age, scantily during two days on an average, and without pain. Married at 21 years, pregnant immediately after, prematurely confined in seven months, after a fall on March 13, 1885. Immediate consequences apparently good, and probable commencement of the

present malady six weeks later at the time of the menstrual return. Profuse metrorrhagia, which has existed a month, and acute pains in left side of abdomen, work impossible, sexual relations very painful. Has kept the bed for a month with fever. Gastric troubles.

*Diagnosis.*—Endometritis. Double prolapsus of the uterine annexes, and left ovaro-salpingitis. Uterus bound down.

*Treatment.*—First galvano-cauterization, intra-uterine, negative, 100 milliampères, five minutes.

June 13.—Improvement as to the pain. Metrorrhagia continues.

June 16.—First galvano-puncture, vaginal, negative, made in the posterior cul-de-sac, with a fine steel trocar, to the depth of one centimetre, without anæsthesia, 80 milliampères, five minutes. Rather lively reaction the same evening of the operation, which became calmed in the night, and after which she was better. Continuation of the metrorrhagia.

June 18.—Disappearance of the pains—has not kept the bed since the beginning of the treatment.

June 23.—Expulsion of a slough last evening and considerable diminution of the retro-uterine exudate, as well as of the vaginal sensibility.

June 30.—The same good condition.

July 4.—Marked improvement.

July 9.—All flow has ceased.

July 11.—Second galvano-puncture, vaginal, negative, in the posterior cul-de-sac, to the depth of one centimetre, 100 milliampères, five minutes, without anæsthesia, and without a sojourn at the clinic—only rested two hours, the same as at the first time.

August 4.—No inflammatory reaction as a result of her last puncture. She has been able to endure easily a journey into the country, from which she has just returned after an absence of three weeks.

August 8.—Same good condition. Third galvano-puncture, vaginal; negative, 50 milliampères, five minutes.

Sept. 12.—Improvement persists. Walking is more easy.

Sept. 17.—Fourth galvano-puncture, vaginal, negative, 50 milliampères, five minutes.

Sept. 22.—Fifth galvano-puncture, vaginal, negative, 50°, five minutes.

Sept. 29.—Offensive return of the pains under the influence of a great fatigue and the renewal of the sexual relations in spite of our injunctions to the contrary. Fresh metrorrhagia.

Oct. 6.—All is quieted, the flow is arrested, and she does not suffer.

Oct. 13.—The improvement continues, the posterior puffiness has almost disappeared, and she can be considered as cured.

Oct. 22.—Another galvano-puncture made

solely for the purpose of perfecting the cure. Sixth and last galvano-puncture, vaginal, negative, made as the preceding ones, to a depth of one centimetre, without anæsthesia, and with the aid of a small steel trocar, after having taken all the precautions possible for vaginal antisepsis before and after each treatment. No sojourn at the clinic, repose only for two hours. All of these galvano-punctures, although painful, were in general well tolerated, and were not followed by any inflammatory reaction.

Oct. 30.—She is very well, she is cured symptomatically and anatomically, all the exudate has disappeared; but the uterine annexes remain prolapsed, a deep and quite forcible vaginal pressure is necessary in order to provoke sensibility. She ceases all treatment spontaneously.

Jan., 1886.—Beginning of a *second pregnancy*, during which she can continue her work without interruption.

August 30.—Premature confinement at about seven months without appreciable cause, expulsion of a dead foetus, immediate results good, almost immediate resumption of her work.

Oct. 6.—Same good condition as a year ago. The uterus can be displaced laterally, but preserves still some posterior adhesions. Defecation, previously painful, is easy and causes no longer sensitiveness. To resume, a year after cessation of treatment the patient remains cured. Symptomatically and anatomically she remains very much improved, her health is perfect in every direction and the sexual relations, impossible before the treatment, provoke no longer any sensitiveness.

January, 1887.—Commencement of a *third confinement*, which developed normally.

Oct. 21.—Normal confinement at term, and results of the lying-in good. Resumption of her domestic work almost at once. Nurses her child.

May 12, 1888.—She has not kept the bed a single day, and has not lost the benefit of her treatment, same anatomical condition, same prolapsus of the uterine annexes, especially the left, without any inflammation.

August.—Commencement of a *fourth normal confinement*, during which she worked constantly.

April 28, 1889.—Confinement at term. Sequelæ of the lying-in excellent, no pains in the abdomen, no leucorrhœa, was able to recommence her work on the tenth day.

June 8.—Is very well, all her functions are normal, she nurses her child.

*Local Examination.*—On pressure, a slight ovarian pain in the left iliac region is observed, the uterus is normal, very movable laterally, but cannot be lifted without a little difficulty, on account of the posterior adhesive bands, same prolapsus of the annexes, more pronounced on the left, with one tube in the recto-vaginal wall, no signs of salpingo-ovaritis.

To resume, the treatment, composed of *one galvano-cauterization and of six galvano-punctures*, had an immediately favorable result, symptomatically and anatomically, which survived four years after, and which permitted the evolution of *three consecutive confinements, of which two were at term.*

#### OBSERVATIONS ON OVARIAN SALPINGITIS ; SUMMARY.

Woman, aged 34, multipara, scrofulous. Until the age of 29 menstruation regular, abundant, and without dysmenorrhœa. Married at 29. Sudden appearance immediately after of an intense, premenstrual dysmenorrhœa. Sanguinous flow and frequency of periods increased. Same unfortunate condition for three years, making work often difficult. For two years progressive aggravation of the local condition : continual abdominal pain, walking almost impossible, daily vomiting, suspension of sexual relations because so painful, beginning of an almost continuous metrorrhagia, unsuccess of all classic treatment. After remaining in bed for eight consecutive months almost all the time, the patient presented herself at clinic August 17, 1886.

*Complete peri-uterine inflammatory exudate, with subadjacent fibroids, und right ovarian salpingitis.*

From August 21 to November 23, 1886, thirteen negative, chemical, intra-uterine galvano-caustics of 60 to 150 milliampères, five minutes each, with two galvano-positives at the beginning, to arrest the existing metrorrhagia, and, in addition, bi-polar galvanization of the pneumogastriacs three times a week.

Marked anatomical retrogression and considerable symptomatic amelioration. In order to perfect the cure, from December 28, 1886, to June 30, 1887, six negative, vaginal galvano-punctures at a depth of one centimetre, posterior and to the right ; two, without chloroform, at an average of 60 milliampères, five minutes each, and four, with anæsthesia, of 150 to 200 milliampères of five minutes each. Amelioration more marked and rapid under the influence of the galvano-punctures. Some vaginal and intra-uterine faradization of *tension*, with the fine wire, were practiced to alleviate the pain, and, simultaneously, galvanization of the pneumogastriacs, which were always victorious over the gastric troubles.

Suspension of all treatment in August, 1887. At this date the patient declared herself symptomatically cured. Walking easy, riding well borne, difficult work tolerated even during the periods, entire disappearance of all spontaneous pain, increase in strength, better health than for several years, menstruation regular, disappearance of all dysmenorrhœa. Anatomically the retro-uterine inflammatory exudate has almost disappeared.

From August, 1887, to March, 1889, all the functions have been normal and the cure has remained well defined.

#### THE ETIOLOGY OF LEPROSY.—A CRITICISM OF SOME CURRENT VIEWS.

*Read in the Section on Dermatology and Syphilography at the Fortieth Annual Meeting of the American Medical Association held at Newport, R. I., June, 1889.*

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Putting to one side, for the present, the bacillus, which all pathologists agree is to be found in every leprous neoplasm, the supposed etiological factors of leprosy which have been most considered of late years, are three, viz., (1.) Heredity. (2.) A diet of fish. (3.) Contagion.

*The theory of heredity* has had immense support, both lay and professional, and it is curious to observe how loth some medical authors are to set themselves free from its trammels, or to question its influence in propagating the disease, even though many of the facts which they themselves adduce seem obviously to lead to quite another conclusion. As Mr. Jonathan Hutchinson points out, 'the fact of leprosy occasionally appearing in healthy immigrants, and just as severely as if such persons belonged to leper families, is enough to prove that hereditariness goes for little or nothing in its causation. It is indeed idle to deny the liability of leprosy to attack individuals who have not the slightest hereditary taint.

In a recent paper,<sup>1</sup> my friend, Dr. Blanc, who has in late years seen probably more cases of leprosy in the United States than any one observer, shows that in forty-two cases treated by him, twelve were natives of foreign countries (seven German, one Austrian, one English, one Irish, one French, one Italian), and of the remainder, eighteen were the children of foreign born parents (chiefly German and Irish), "from which we conclude," he says, "that if the disease is hereditary, it must be derived from a variety of foreign sources ; and if acquired then it seems to attack the children of immigrants as often as those of the older native families." What evidence can be stronger against heredity?

An important paper on the Heredity of Leprosy has lately been published by Dr. G. A. Hansen,<sup>2</sup> who made a journey to North America last year to see what had become of the Norwegians who had gone there as lepers or had de-

<sup>1</sup>Clinical Lecture on "Leprosy, its Cause," etc.—Med. Press and Circular, Nov. 4, 1885.

<sup>2</sup>"Leprosy in New Orleans." N. O. Med. and Surg. Journal, 1888.

<sup>3</sup>Virchow's Archiv., Vol. CXIV. 1888.