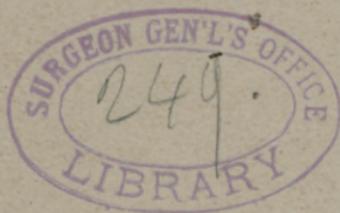


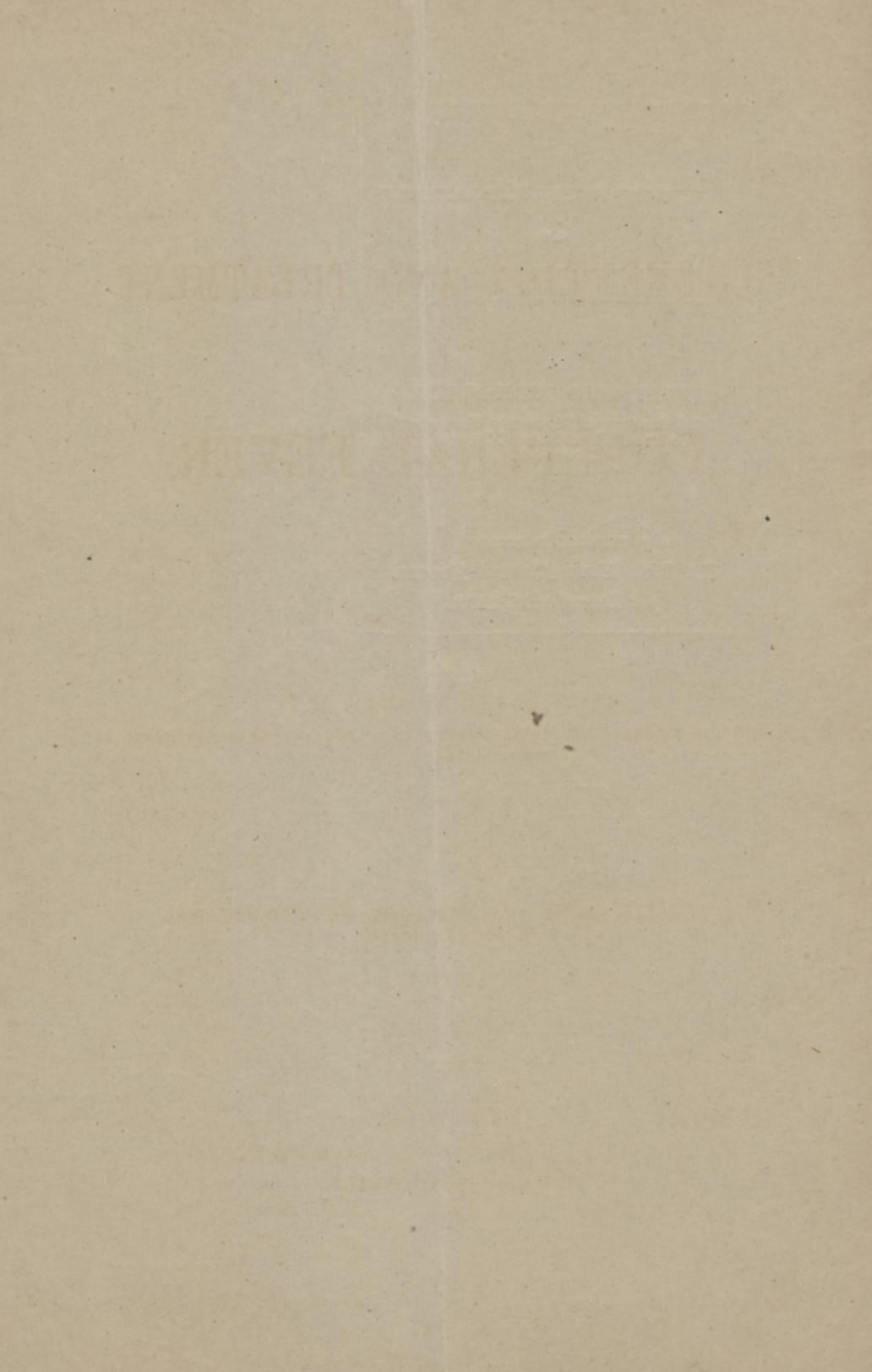
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THE
PREVENTION AND TREATMENT
OF
PUERPERAL FEVER.

BY
T. GAILLARD THOMAS, M. D.,
Clinical Professor of Diseases of Women in the
College of Physicians and Surgeons,
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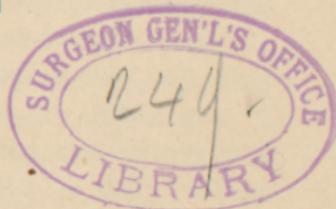




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THE PREVENTION AND TREATMENT OF
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At a time when a flood of literature pours in upon the practitioner of medicine from numberless sources, upon every conceivable subject connected with his calling; when original ideas are spread out over space as gold-beaters hammer foil; and when the changes are rung upon every meritorious essay by a host of others which offer the reader merely the same thoughts in different words—it is pertinent and justifiable for every member of this audience to demand the motive, or, as our Gallic neighbors would express it, “the *raison d’être*,” of a paper upon so trite a subject as the present, and one which has already received the attention of many of the brightest intellects devoted to obstetrics.

I accept this challenge to-night, and, before beginning my essay, shall strive to justify, if I can, its preparation. I freely confess that it contains nothing that is original, nothing which has not elsewhere been as fully and as clearly stated, nothing which has not already received careful consideration at the hands of the progressive obstetri-

* Read before the New York Academy of Medicine, December 6, 1883.

cians of the world. And yet I am not only emboldened to present it, but even to hope that it may be regarded as worthy of the attention of those who listen to its reading to-night, and that, in its dissemination among many in this country in whose medical pupilage I have taken part, it may accomplish good.

The plan of treatment for that hydra-headed monster styled puerperal fever, which I shall advocate, has nowhere, so far as my knowledge extends, been fully elaborated in any one essay, and carefully systematized; the various portions of the plan are not yet even generally accepted as orthodox; and many appear at this late date to have paid little attention to them in practice, even if they have seen them in print.

In support of these assertions I will refer to these two facts. In the year 1879, at a session of the American Gynecological Society in Baltimore, the question of intra-uterine antiseptic injection for the cure of puerperal septicæmia came up for discussion. It received very qualified approval, and, with one exception, if my memory serves me right, I stood alone in its strong and uncompromising advocacy. About a year ago I related, in a society of this city, the history of a bad case of puerperal septicæmia which was, beyond question, saved by the persistent and bold use of intra-uterine injections. This very desultory report was published in some of the medical journals of this city, and after its appearance I received a half-dozen letters from men at a distance in this country, asking how the injections were made, and other questions showing so great a want of familiarity with this valuable method that I became convinced that still another exposition of its merits might prove well-timed and useful.

Lastly, I would state that I was, if not the first, at least among the very first, who adopted the use of intra-uterine

injections and cutaneous refrigeration, in the very inception of both plans in this country; that I have since then never ceased to urge them as valuable resources upon the numerous practitioners with whom I come in daily contact, as teacher, consultant, and associate; and that, for this reason, I trust my large experience in and present estimate of these methods may prove of some value.

Of all the great benefits which have, within the past quarter of a century, been conferred by the advancing science of medicine, in my opinion, none has been more important and more signal than that relating to the prevention and the cure of the febrile conditions incident to the puerperium. Even before the new era which has recently dawned upon this subject, the personal communicability of these dangerous affections was fully recognized, but it was left for the establishment of the germ theory of disease to render their extreme contagiousness fully appreciated; to impress the facts that, with proper precautions, prevention was within the range of possibility, and that treatment based upon the knowledge thus given us might be made effective, and, to a great degree, certain.

Ever since the days of Hippocrates, pathologists have striven earnestly to elucidate the phenomena of those diseases which developed in consequence of the process of parturition, and produced such lamentable results. Over two thousand years have elapsed since that time, and only now have we passed "out of the darkness into the light" in reference to the matter, for now it does really appear that we are beginning to understand the pathology of that group of affections styled puerperal fever. The views which were, during this long period, at various times advocated and more or less generally adopted, are thus enumerated by Hervieux* in his masterly and exhaustive treatise upon this subject:

* "Traité clin. et prat. des mal. puerpérales," Paris, 1870.

The doctrine of suppression of the lochia; the doctrine of metastasis of the milk; the doctrine of inflammation of the uterus and peritonæum; the doctrine of a specific puerperal fever; the doctrine of uterine wounds as we have one after an amputation; the doctrine of a multiplicity of puerperal affections grouped under one common name; the doctrine of puerperal blood-poisoning.

Let us pause here and review the features in the condition of the puerperal woman which render her a prey to so many and dangerous disorders which spring up as consequences of utero-gestation and of parturition.

In the first place, her blood is in a condition of hyperinosis—that is to say, it contains a great excess of fibrin. If it be drawn by the lancet, it presents the buffy coat, upon which our forefathers laid so much stress, in the most marked degree; and from this arise two liabilities—first, a tendency in such blood to form thromboses in the heart and the blood-vessels, and, second, a tendency to prove a most prolific ground for the development of sepsis and zymosis. Measles, scarlatina, and varioloid, which give no very bad prognoses when they excite zymosis in the blood of the non-pregnant woman, commonly produce death when they act upon the blood of pregnancy.

Then the nervous system is in a plus state of sensitiveness and excitability, and influences which are very controllable in the non-puerperal state produce very evil results here. For example, an accumulation of urinary poisons in the blood produces convulsions; an untoward moral influence produces violent mania; and crude ingesta result in severe spasmodic affections in the alimentary canal which, in the same woman when not pregnant, would scarcely have attracted attention.

The local conditions which result from parturition are even more striking. The uterus and other pelvic viscera

are, at full term, as fully supplied by lymphatics and lymphatic glands as is shown in this diagram; * and the arteries, veins, nerves, and other tissues of that organ, the vagina, the uterine ligaments, and the peritonæum have all undergone a rapid physiological hypertrophy, which permits of an organ only three inches in length ascending so as to touch the ensiform cartilage.

The uterus about the 280th day of gestation contracts and expels the child; then the placenta and membranes; and then closes its emptied cavity, and rests. Let us suppose that in forty-eight hours after delivery a primipara dies of pneumonia, and that we are allowed to lay open the genital tract and examine it from the fundus uteri downward. Outside all looks well; the uterus is merely much larger than in the non-pregnant state. Within, it presents a very different appearance; the whole endometrium, covered over by the greyish, sloughy-looking decidua vera, presents all over its surface an unhealthy, unclean, and diphtheritic look, although free from exudation. Here and there shreds of membrane, consisting of small portions of the decidua reflexa, which had become adherent, appear, partially detached and somewhat decomposed. At one point the large placental site is seen, raw, irregular, and covered over by minute traces of the placenta and small blood-clots which close the mouths of the uterine sinuses. The odor of the opened uterine cavity, the walls of which are thus covered, is disagreeable. The substances mentioned have for forty-eight hours been dislodging themselves and mingling with the pinkish fluid which pours like an unhealthy sweat from the placental site; constitute what is called the cleansings, or lochial discharge. Upon examining the cervix uteri, we find two or three small rents which pass through the mucous lining and involve to a varying depth the sub-lying parenchyma. In consequence

* Here Dr. Thomas showed diagrams.

of these injuries, and of absorption through them of the lochial discharge already mentioned, the cervix is swollen and œdematous. As we examine the vagina it will be found that the great distension impressed upon it by the head of the child in its passage to the vulva has in two or three places caused a superficial rupture of the mucous lining of this canal.

We now arrive at the vulva, and here we find several solutions of continuity which have been effected by the escaping head. The fourchette has been torn through, and this rent has extended through a small portion of the perinæum, and one or two small fissures have occurred in the mucous membrane covering over the ostium vaginae.

Were we to take some of the lochial discharge from the vagina, after the atmosphere has acted upon it, and, abrading the inside of the finger with a lancet so that it bleeds slightly, apply this freely to the denuded surface, and allow it to become dry there, its irritating character would soon become evidenced by a burning sensation in the part, a smarting extending up the hand, and on the next day signs of a slight local inflammation, with a little lymphangitis, would be noticed. This would probably last only two or three days—merely long enough to demonstrate the fact that the fluid is an irritating one, but not sufficiently poisonous to cause erysipelas or severe angeioleucitis.

The natural history of the ordinary local results of human parturition is given in the foregoing sketch. In every case of child-bearing the endometrium is thus incumbered and freed by a process of exfoliation and sloughing; in every case the cervix, vaginal mucous membrane, perinæum, and vulva are, in varying degrees, lacerated; and in every case the offensive fluid, called lochia, poisons these freshly made, unprotected wounds. And yet what are the usual

results? Recovery, uniformly, I might say universally, unless some unusual occurrence manifests itself to prevent this happy consummation! Theorizing about the matter, one would suppose that the mortality resulting from such a state of things must be excessive. Here we have a number of recent wounds constantly and unavoidably bathed with a fluid made up of dead and decaying animal tissue in a woman whose blood and nerve states are, with reference to septic disease, like flax prepared for the spark, and who is exhausted by pain, anxiety, loss of blood, and deprivation of sleep. Can one point to any concatenation of circumstances better calculated to insure a bad result? And yet the facts are these: only about one or two in every one hundred parturient women ordinarily die when properly cared for during labor, even in public hospitals.*

Recovery, then, is the very general rule after normal parturition; death the very rare exception. But now and then all this is changed. Some ferment or specific poison gains access to the genital canal and acts as rapidly and as decidedly as a little yeast added to dough. In the latter case, active and immediate fermentation affects the whole mass; in the former a set of striking, alarming, and often fatal phenomena occur, which spread dismay through the lying-in chamber and give an entirely new complexion to the progress of the case. The fact that this unfortunate occurrence has taken place will usually announce itself to the attending physician in this way. He leaves his patient on the morning of the third day cheerful, happy, free from pain, with a pulse of 85, and a temperature of 99°. He is called to her in the latter part of that day and finds that she has had a slight, perhaps a scarcely perceptible, chill; that some pelvic pain has followed it; that the lochia have ceased; that the milk which was just showing itself has disappeared; that

* Tarnier, "Report of Maternité Hospital," Paris.

a severe headache exists; that a look of indescribable anxiety has replaced the happy expression of the morning; that the pulse rate is 130 to the minute, and that the buccal temperature is 104° .

A poisonous element has by some method or other reached the genital tract, as fruitful a field for its activity as a mass of dough is for yeast, and the result is already manifesting itself. Let us suppose that the patient's medical attendant lays the flattering unction to his soul that all this is due to "malaria"; or that he soothes his troubled mind with the hope that it is "milk fever"; or that, recognizing the attack as one of "puerperal septicaemia," or "blood-poisoning of child-bed," the first link in that terrible chain called puerperal fever, he relies upon medicines given by the mouth or rectum, what is usually the course shown as the natural one of the affection? Within a week, or thereabouts, for there is no rule as to this point, parenchymatous metritis, lymphangitis, lymphadenitis, phlebitis, cellulitis, or peritonitis will very probably develop itself, and what was originally merely a septicaemia will merge into one of these affections, and the patient will pass through the perils attendant upon whichever of these pathological states manifests itself as a consequence of the initial lesion.

Sometimes the septic disorder develops puerperal mania, while at other times a septic pleuritis, endocarditis, pneumonitis, pericarditis, or meningitis follows the systemic poisoning, the lymphatics emptying their deadly contents into the thoracic duct, and thus transferring them into the subclavian vein, as Lusk clearly points out. At other times the condition continues one of true and uncomplicated septicaemia to the end, death occurring from coma, or the patient succumbing to exhaustion from hyperpyrexia, which lasts for weeks. What was originally septicaemia, however, as a rule rarely remains so, but generally passes into one

other disorder, and very generally into peritonitis, before a fatal termination occurs.

And now comes naturally the question, What is the pathology of that affection styled puerperal fever? An inquiry into the views which prevail among others would evidently require more time than I can possibly allot to it to-night; and yet I am desirous that my answer, even if very short, shall be so clear, succinct, and simple as to convey perfectly the opinion which a practice of thirty years has impressed upon my own mind concerning a subject which has always deeply interested me, and in connection with which I have had abundant opportunity for study, both at the bedside and in the dead-house.

My observations have led me to adopt the views of those who believe that *puerperal fever is puerperal septicæmia*. It matters not whether it assume the form of metritis, phlebitis, cellulitis, peritonitis, or lymphangitis, the essence of the disorder is a poison, which is absorbed into the blood of the parturient woman through some solution of continuity, and which, in the appropriate soil of the puerperal condition, fructifies and produces the result known in its *ensemble* of pathological phenomena as puerperal fever. From my stand-point, the matter is well stated by Lusk * when he declares that "it has now passed beyond the domain of dispute that puerperal fever is an infectious disease, due, as a rule, to the septic inoculation of the wounds which result from the separation of the decidua and the passage of the child through the genital canal in the act of parturition."

As early as 1870, Hervieux, in his work on the diseases of child-bed, already alluded to, expressed himself upon this point in the following words: "Here I stand; if what I have said does not carry conviction of the truth of my doctrine, fuller explanation will fail to do so. I believe in the

* "Midwifery," p. 608.

multiplicity of puerperal diseases. I believe in puerperal poisoning as the source of them. Here, in two words, my creed is presented."

In 1877 the Berlin Obstetrical Society appointed a committee on puerperal fever, consisting of Schröder, Löhlein, A. Martin, Fasbender, and Boehr—men whose names are sufficient to command attention, even if their words fail to carry conviction. In its report this committee expresses its views thus:* "Under the names 'puerperal fever,' 'malignant child-bed fever,' are included a group of diseases occurring in child-bed which vary very greatly in their manifestations, but have this in common, that they are called into being by the absorption from the organs of generation of a material which gives rise to destructive inflammation and fever. There are, indeed, a number of substances, mainly composed of organic materials in a state of putrid decomposition, which, when brought into contact with an open wound, set up inflammation in it, which extends to the neighboring tissues; a further absorption by the lymphatics and blood-vessels leads to more extensive inflammation among neighboring and remote organs; and, when a large quantity is rapidly absorbed into the blood, a quickly fatal poisoning of the whole organism occurs. To surgeons the deadly effect of these materials upon wounds is only too well known, and the greatest advance, probably, which surgery has ever made consists in the so-called antiseptic method of treating wounds—that is, in the scrupulously exact removal of such materials from fresh wounds.

"Puerperal fever is indeed nothing else than the infecting of fresh wounds, such as are found in every newly delivered woman, with these destructive septic materials. Almost every woman, after labor, has small wounds on the external

* "Report of Puerperal Fever Committee of Berlin Obstetrical Society," December 4, 1877, p. 9.

genital organs, which are caused by the passage of the child through this narrow opening, and in every newly delivered woman the inner surface of the uterus, from which the protecting membrane has been cast off with the ovum, presents a large wound surface. Thus, every newly delivered woman is liable to suffer from the dreaded infective wound diseases, which, in persons wounded under other circumstances, are called pyæmia, septicæmia, wound-fever, blood-poisoning, purulent infection, etc., *so soon as suitable septic materials are brought into contact with the genital organs.*"

And now a few words upon the nomenclature of this disease, which for so long has been known under the names of puerperal fever, child-bed fever, lying-in fever, and the names of the various special affections which develop in its course—phlebitis, lymphangitis, etc. Of late an effort has been made, which I think has emanated from that school of obstetrics which has shed so much luster upon our art, and enriched with so many eminent names the obstetric register of the world—the Dublin school. By members of this it has been urged that the name metria should supplant that of puerperal fever.

I for one sincerely trust that the suggestion will never be adopted. In what is the new name better than the old and faulty term? Does it convey any more accurate pathological facts to the minds of the student? Does metria exclude any chance of error as to pathology, or advance the clearness of understanding in any wise? I think not. Of the two terms it appears to me that, while both are objectionable, metria is the more so.

On the other hand, puerperal septicæmia conveys to the student and to the practitioner a clear and definite idea, which appears to be in consonance with the truth as taught us by modern pathology. In spite of the fact that important complications commonly result from the initial lesion, it ap-

pears to me that the influence of this is so paramount that its title should be adopted in spite of the fact that it is far from being absolutely perfect.

I should willingly, for the present, accept the reservation offered by Dr. Robert Barnes,* when he says: "I would propose that the word should not assume that a distinct, specific poison, or sepsis alone, is concerned, but that it should be used comprehensively as a general term, implying that the blood of the puerpera is poisoned"; and this although I do believe in the existence of a specific poison, which is the great factor, as surely as I believe in such a factor in the production of typhus or variola.

What is the nature of this subtle and deadly poison, which, entering like a ferment into the genital canal of the puerperal woman whose blood is hyperinosed, whose nerves are in a condition of hyperæsthesia, whose utero-placental vessels are partially open, whose cervix uteri, vagina, and vulva are covered with fresh superficial wounds, and whose womb is pouring slowly forth a fluid composed of dead tissue, decomposed blood, and recently exfoliated cells, gives rise to so much disturbance? What do we know of the poison? what is its natural history? what encourages its life? and what kills it, or cripples its activity?

Unfortunately, these questions can not to-day be satisfactorily answered; but have such questions been any more satisfactorily answered with reference to scarlatina, measles, and varicella? German pathologists have proved that the presence of micrococci, more especially of the round bacteria, occurs so frequently in the pathological products of puerperal diseases as to lead to the conviction that they are important factors in reference to them; but this point, like many others connected with the influence of bacteria as morbid agents, is yet too unsettled for admission into a

* Lecture in "Am. Jour. of Obstetrics," January, 1882.

practical treatise like the present.* Inquiry into the matter is now being pushed with vigor in the laboratories of France and Germany, and we have, according to recent reports, a fair prospect of valuable and practical results.

But, even although we do not at present know the exact nature of the poison which proves the disturbing element in these cases, we surely know that some such toxic agent exists, and it behooves us to learn how to prevent its entrance into the genital tract, and how best to destroy its life or its activity if it should gain admission in spite of our care and watchfulness.

Whatever be the character of this agent, we know that there are *two, and only two*, methods by which it can reach the parturient tract and exert its baneful influence. First, it may be carried to the vulva and into the vagina through the open orifice of that canal by the atmosphere, in which it floats as an impalpable substance; and, second, it may be carried to any part of the genital tract by the fingers of doctor or nurse; by towels or cloths laid against the vulva; by sponges used in washing; by instruments used in the delivery of the child, drawing of urine, or injecting the vagina; and from the bed-clothing and body-clothing of the patient which are in immediate contact with the sexual organs.

As this paper is already assuming proportions greater than those which I originally prescribed for it, I shall deal with this part of my subject rather dogmatically, offering a number of propositions which will embody in a few sentences what would otherwise demand a great deal of space for its enunciation. I shall address my remarks chiefly to the management of cases of midwifery occurring in private

* In reference to this part of our subject I would refer those interested to the chapter upon it by Professor Lusk, in his masterly book upon the "Science and Art of Midwifery."

practice, as the wards of hospitals have long been subjected to systematic rules, while my observation in the capacity of consulting physician positively convinces me that in private practice, even among the wealthy who can command every safeguard and procure every luxury, there exist a want of system and an apathy as to preventive measures which border very closely upon criminality. To-day, when it is so generally agreed among the ablest obstetricians of the world that puerperal fever is the result of a special poison, and that prophylaxis against this is, by close attention to very simple details, perfectly practicable; it is the duty of every practitioner to guard his patient against danger by every means in his power. If he accept the views which this paper adopts, his duty is clear; it is equally incumbent upon him to give his patient the benefit of the doubt if he reject them.

Prophylactic measures which should be adopted in all midwifery cases, whether they occur in hospital or in private practice :

1. The room in which the confinement is to take place should have the floor, walls, and furniture thoroughly washed with a ten-per-cent. solution of carbolic acid or mercuric bichloride, 1 to 1,000, and the bedstead and mattresses should be sponged with the same solution. Curtains, carpets, and upholstered furniture should be dispensed with as far as possible.

2. The nurse and physician should take care that all their clothing, both under and upper, be clean and free from exposure to the effluvia of any septic affection. Should either of them have been exposed within a fortnight to the effluvia of such affections as scarlet fever, typhus, erysipelas, septicæmia, or the like, they should change every article of clothing and bathe the entire body, especially the hair and beard, with a reliable antiseptic solution; that which

I prefer for this purpose is a saturated solution of boric acid.

3. As labor sets in, the nurse, having thoroughly washed her hands, cleaned her nails with a stiff nail-brush, and soaked them in antiseptic fluid, should administer to the patient a warm vaginal injection of antiseptic character; bathe the vulva and surrounding parts freely with the same; repeat this every four hours during labor; and keep a napkin, wrung out of the warm antiseptic fluid, over the genital organs until the birth of the child.

4. Before assuming the functions of their respective offices at the moment of labor, both doctor and nurse should wash the hands thoroughly with soap and water, *scrub* the nails with a stiff nail-brush, and soak the hands for several minutes in a bichloride solution, 1 to 1,000.

5. The first two stages of the labor having been accomplished, the third stage should be efficiently produced; all portions of placenta and membranes removed; and ergot administered, in moderate dose, three times a day, and kept up for at least a week, for the complete closure of the uterine cavity, expulsion of clots, and occlusion of the utero-placental vessels.

6. The doctor, taking nothing for granted, not satisfying himself with a vague report of the nurse, should, at the conclusion of the labor, carefully examine the vulva of the patient. If the perinæum be lacerated, it should be closed at once by suture, to shut up this avenue to septic absorption; and, should slight solutions of continuity be found in the labia or the vulvar extremity of the vagina, these should be dried by pressure of a linen cloth, touched with equal parts of sol. ferri persulph. and carbolic acid, again dried thoroughly by pressure with the cloth, and then painted over with gutta-percha collodion. If this be thoroughly done, absorption will be prevented at these points for

at least three or four days, when the application may be repeated.

7. In six or eight hours after the labor, when the patient has rested, the vagina should be syringed out with an antiseptic solution, and a suppository of cocoa butter, containing from three to five grains of iodoform, should be placed within it, under the os uteri. A syringe with intermittent jet should be used, which will wash away with gentle force all blood-clots, and reliance should not be placed upon the feeble drip of the fountain syringe, the advantages of which are, I think, entirely theoretical.

8. These vaginal injections and suppositories should, in cases of normal labor, be repeated every eight hours; in cases of difficult or instrumental labors, twice as often; and they should be kept up for at least ten days, the nurse observing to the last the precaution already mentioned of washing her hands before every approach to the genital tract of the patient.

9. When catheterization becomes necessary, it is safer to employ a new gum-elastic catheter, which before use should be thoroughly immersed in antiseptic fluid, and which should be destroyed at the conclusion of the case, rather than to trust to the nurse's cleansing of an old silver instrument which bears within it the register of a list of cases of septicæmia in which she has employed it during the past two or three years. *It is a very common and very bad habit for nurses to own silver catheters, which they carry about with them from case to case of midwifery.*

10. Last, but by no means least, let the physician inform himself by personal observation as to the competency of the nurse to syringe out the vagina thoroughly, to place the antiseptic suppositories just where they should be, and to use the catheter without injury to the patient. Neglect of this precaution has frequently resulted in leaving a fœtid

upper segment of the vagina entirely unwashed, while the antiseptic stream was limited to the lower third of the canal.

In a case in which I had performed anterior colporrhaphy and perineorrhaphy at the same time, in private practice, I was forced to withdraw my sutures and sacrifice the operations on account of a sudden rise of temperature to 105°. As I had become alarmed about the patient, I then used the syringe myself, and, to my great surprise and regret, found the upper portion of the vaginal canal filled with a decomposed mass of blood, which the constant but inefficient injections of the nurse had failed to remove.

Even if every suggestion made here be faithfully followed out in every case of labor which one attends in private practice, the trouble involved in the plan will not be great; and it will fall into utter insignificance when measured with the great comfort which will come to the mind of the obstetrician from the reflection that he has fully done his duty in exerting himself to the utmost to protect the vital interests which have been intrusted to his care. This feeling, which would be pleasant if no untoward event occurred, would be tenfold more so if a fatal issue should give rise to the painful inquiry as to his having fully acquitted himself of his duty in respect to prophylaxis. In the past this unpleasant question has not been often raised, but, as society at large becomes more thoroughly informed upon the prolific subject of the germ theory of disease, it appears to me that he will stand firmest who can point to a clear record of strict attention to preventive medicine.

It is clear that all this will make of the process of parturition in the future a more important event than it has been regarded in the past, and she who is about to bring forth will be treated as one about to go through the perils of a capital operation. This is just what I think ought to take place, and, when it does so, thousands of valuable lives

which are now lost will be saved, and thousands of desolate households will be spared the sorrow of losing their female heads.

I am fully aware that, at the conclusion of this paper, more than one speaker will arise and declare that his experience of many years of large midwifery practice, with scarcely any deaths, convinces him that all these precautions are unnecessary, that the process of parturition must have changed its character, or that this magnifying the perils of a simple physiological process is a work of pure supererogation, which will have its day, and then for ever pass away. I will simply say in advance to these speakers that I don't agree with them, and then quote the language of the Puerperal Fever Committee of the Berlin Obstetrical Society, in pressing the preventive measures of antiseptic surgery upon the Prussian government.

* "We shall not attempt to portray, from a humanitarian point of view, the anguish which falls upon the numerous families, where the wife and mother, who but just now was radiant with the full bloom of health, has been carried off, just as the family has been increased by a new member, still utterly helpless and dependent upon a mother's care; nor shall we point out what injury is done to the national life of the state by the yearly death of thousands of mothers, and the ruin of thousands of families caused thereby. We may fitly compare the manner in which puerperal fever finds its victims in a definite class of persons, with the losses which are entailed by a great war. Just as, in the latter case, the losses fall exclusively upon the young and vigorous male population, *so in the former is the most valuable part of our female youth carried off by puerperal fever*; nay, more, the loss which the family and the state suffer in consequence of puerperal fever is more acutely felt than that which in

* *Op. cit.*, p. 8.

general accompanies war, because the latter concerns usually the unmarried and only just full-grown young men. The loss of an entire battalion of *Landwehr* is the only one which can be fittingly compared, in the severity of its results and the intensity of distress which it causes, with the ruin which puerperal fever brings with it."

Before leaving this part of my subject, let me in the strongest manner record my protest against the use of intra-uterine injections as a prophylactic measure, except after very severe operations within the uterine cavity, which render the occurrence of septicæmia almost certain. As a preventive measure, to be uniformly adopted, I look upon it as to the last degree rash and reprehensible. The use of a dangerous remedy in combating the results of a dangerous disorder is always admissible, but a resort to a hazardous procedure for a condition in connection with which danger has not shown itself, and may not do so, should be viewed in quite a contrary light.

Treatment of Puerperal Septicæmia.

Let us now suppose that, in spite of every precaution, the specific poison has gained entrance at one of the numerous door-ways left open in the genital tract between the vulva and the fundus uteri; what are the most reliable means now known to us for checking the advance of the septic disorders which are set up in consequence?

But let me stop here, before answering the question just asked, and explain what I mean by the use of the term specific poison. I do not believe that there is, necessarily, any specific disease germ which gives rise to *puerperal septicæmia*! It is probably the same germ as that which is the source of septicæmia, phlebitis, and lymphangitis in the stump after an amputation, in the wound created by a compound fracture, or in the lacerated tract produced by a gun-

shot. But the pathological condition excited appears to me to be entirely different from that putrid absorption which results from the decomposition of a retained placenta, or a putrid mass of blood. Such decomposition produces a toxæmia, violent and dangerous it is true, but which disappears as soon as the offending mass is removed. That of the true puerperal disease at once, or almost at once, diseases the lymphatics and sets up an action which often proves uncontrollable. *If the mere presence of decaying animal material in a uterus would produce puerperal septicæmia without the agency of a specific disease germ, we should surely have that affection developing in healthy country localities where the women are attended by ignorant midwives, but where, nevertheless, it is almost an unknown disorder.*

“I,” says Hervieux, “who write these lines, declare that in my own country I have within the space of three years attended one thousand cases of labor, and out of that number have lost only one patient!”

And now, in summing up what I esteem the most certain and the most rational treatment of the disease styled puerperal fever, I will be as concise as possible.

As soon as the patient is stricken by the poison, certain very marked phenomena usually develop themselves with great promptness. After a chill or a slight horripilation she is affected by a high temperature, pelvic pain, considerable mental perturbation, headache, pain in the back, and sometimes, though not commonly, by nausea and vomiting. We will assume, first, that the attack is a severe one in its inception; and, second, that the patient is in such a position in life that we are not in any way hampered in our efforts to save her by considerations of economy. Having considered treatment from these standpoints, it will, of course, be easy to modify the plan so as to meet the requirements of a mild attack or of a scanty purse.

As the practitioner sits by the bedside of his patient at the commencement of her attack, he is aware that there are points connected with its true pathology which he can not yet determine. For example, he can not say whether the case is going to assume the form of septicæmia lymphatica or septicæmia venosa; whether of perimetritis or parametritis; or whether thrombosis of some of the large pelvic or utero-ovarian vessels or a true parenchymatous metritis is to play the most active part in the siege which has begun. If he fritter away the golden moments in vague speculation; if he soothe his fears by hoping that the attack is due to malaria or milk fever; or, if he cast aside the rational doctrines of to-day in favor of the idea of a general infectious and particular form of disease called by the forefathers of the French school "*la fièvre des femmes en couche*," time will be lost which can never be regained. If, on the other hand, he is encouraged by his clinical observation to stand with many of the best pathologists and practitioners of our time in the position assumed by Hervieux—"I believe in the multiplicity of the affections classed under the head of puerperal fever; I believe in puerperal poisoning as the source of them"—he will act at once and strike at the poison before it has fairly gained a foothold. In other words, if the physician could see into the future and learn with certainty that peritonitis, cellulitis, thrombosis, lymphangitis, or true phlebitis is to be the final disorder, he should, if he reaches the case at the inception of the attack, follow, in my opinion, the course here formulated:

1. As soon as a diagnosis of septicæmia is determined upon, all pain, nervous perturbation, shock, and mental anxiety should be quieted by the hypodermic administration of ten minims of Magendie's solution of morphine, unless some special and very decided idiosyncrasy with reference to opium be ascertained to exist; and throughout the

severity of the attack, whenever suffering of mind or body occurs (perhaps it will be about once in every six or eight hours), this should be repeated. In my experience, no other method of administering morphine in these particular cases compares with this, and, as it is not to be continued long, there is no fear of causing the patient to become addicted to the drug as a vice. If a small, sharp, and *new* needle be used, if it be thoroughly cleansed with soap and water before each time of using, and be dipped in a solution of bichloride, 1 to 1,000 of water, just before each insertion, no abscesses will occur. It is the large, rusty, unwashed, and unpurified needle, which the doctor's economy makes last him for many months, which so commonly results in them.

2. The physician must now decide whether, in his opinion, the septic disease which is developing has originated in the wounds situated between the os internum uteri and the vulva, or in the endometrium, above the former point. If he decide in favor of the former view, he should persist, for a time longer, in the more thorough use of vaginal injections; if of the latter, intrauterine injections should be at once resorted to. Usually the question has to be decided by the efficacy or inefficacy of frequent germicide vaginal injections in bringing down the temperature and controlling other grave symptoms. Should a failure of these seem to prove that the origin of the disease is higher up the genital tract, more decided and radical measures must be taken.

The patient having been entirely relieved of pain and thoroughly quieted, the first injection should be practiced in this way: An India-rubber cloth should quietly, without hurry, noise, or disturbance on the part of the nurse, be spread over the edge of the bed on which she lies, and made to fall into a tub of warm water rendered antiseptic

by the addition of 2 or $2\frac{1}{2}$ per cent. of carbolic acid, or of the bichloride of mercury, 1 to 2,000, or of some other reliable germicide. Then Chamberlain's glass uterine tube, which I here show, or the very excellent and ingenious tube invented by Dr. George H. Lyman, which is here seen, thoroughly fitted to a Davidson's or Higginson's syringe, should be immersed in the tub. The nurse now aiding the patient by the shoulders, and the doctor by the hips, she should be gently laid across the bed and be made comfortable with a pillow under the head. Each foot should rest upon a chair placed at either side of the tub, and she should be entirely covered over with a couple of blankets. The doctor, now placing himself between the knees of the patient, should take the tube in his right hand, while a stream of water is made to flow through it by the nurse, who squeezes the syringe bulb; and he should pass it gently up to the fundus of the uterus. The stream of water, which has been steadily flowing, is now projected with gentle force against the walls of the uterus, washing away adherent blood-clots, detaching portions of hanging membrane, and everywhere neutralizing the influence of the poison which has excited the disorder.

After the first injection, the position of the patient need not be disturbed, but the injections may be given as she lies upon a bed-pan.

In some cases, in which I have had reason to suspect that portions of the placenta or membranes have been retained, I have chloroformed the patient, passed the hand, rendered thoroughly aseptic, within the cavity, and very gently scraped off adherent masses from the uterine walls, using the nails as a curette, as Wilson, of Baltimore, has advised. In some other cases I have rubbed the whole endometrium with an aseptic sponge, held in a long sponge-holder, or employed the largest of my curettes, to remove

clots and adherent secundines, with great apparent advantage.

That the use of antiseptic uterine injections after parturition is attended by danger is beyond question. The greatest hazard attending this plan is the entrance of air into the uterine cavity; the next, the production of hæmorrhage by detaching some of the thrombi which fill the mouths of the uterine sinuses; the third, the danger of forcing the fluid used as an antiseptic directly into the general circulation, through the introduction of the tube into the mouth of a sinus; the fourth, the creation of convulsions, violent pain, or nervous prostration, by a sudden and baneful influence upon the nervous system; and the fifth, the passage of the tube into a Fallopian canal, and the injection of fluid directly into the peritoneal cavity, as in a case reported by Dr. W. Gill Wylie in an interesting paper in the "New York Medical Journal" for June 23, 1883, p. 679.

All these dangers may be, to a great extent, avoided by care as to details: by using a large injecting tube which can not enter an open-mouthed sinus; by using water warmed to 105° ; by injecting the fluid through the tube so as to exclude air before passing this up to the os uteri; by using only a moderate degree of force in throwing the jet against the uterine walls; and by proceeding with the whole affair gently, cautiously, slowly, and intelligently.

The tube should never be allowed to fill the os uteri completely, so as to prevent the escape of the injected fluid. Should the cervical canal be so narrow as to hug the tube closely, it should be dilated by dilators of hard rubber, by the fingers, or by Barnes's bags, before the injection is practiced.

A solution of the persulphate of iron should always be at hand in case of sudden hæmorrhage from displacement of a thrombus. Should this accident occur, ergot should

be immediately given hypodermically, the iron solution be at once added to the antiseptic solution and allowed to pass into the uterus, and pressure be made upon the fundus so as to stimulate the contraction of uterine fiber to accomplish closure of the open sinuses in that way.

Quite a number of cases of death from this plan of treatment are on record. In a very large experience with it I have met with but one. The whole number on record would, however, fall, I think, into insignificance if weighed in the balance against the many deaths which have been due to a neglect of the means, or against those lives which have been saved by it.

After all, the question as to the dangers attending a plan of treatment are not to be settled upon mere abstract reasoning. The evil which it is known to do must be weighed in one scale, and the good which it effects in another; and careful consideration must decide whether we are justified in accepting the former for the sake of the latter. Judged in this manner, I feel very sure that intra-uterine injections for puerperal septicæmia deserve a place among the most valuable resources for the saving of life for which we are indebted to modern pathology.

The frequency of these intra-uterine injections should vary greatly with individual cases. In mild cases of septicæmia, where the temperature comes readily down after the uterus has been washed out, and rises very slowly, they need only be used once in every five hours; in other cases they become necessary once in every three hours; and in bad cases they are required once every hour. These injections should always be administered by a physician, should always be carried fully up to the fundus uteri, and should always be used with every regard to caution as to detail which has been already mentioned.

Many prefer the use of those syringes which allow of a

steady flow of a stream of water, propelled by gravitation, as is the case with the so-called fountain syringe, which is so popular among us. This is partly because greater safety is supposed to attach to these, and partly from a theory that danger attends the propulsion of a stream by intermittent jet against the uterine walls. For a number of years I shared this belief, but experience has taught me that a gentle projection of the fluid is an advantage, that by this means a more thorough cleansing is accomplished, and that with due caution no more danger attends the plan than that by the steady flow.

Some have adopted continuous irrigation of the uterine cavity, but this is, I feel perfectly certain, a delusion and a snare. It gives the appearance of great thoroughness, which it does not possess, for the reason that by this plan it is very difficult to bring the germicide fluid into full contact with the entire endometrium. For vaginal irrigation it is an excellent method, but I have seen it allow the temperature to remain high when applied to the uterine cavity, and have replaced it by the intermittent douche, used only as often as every three hours, with striking results. Nevertheless, in very severe cases I prefer to employ continuous irrigation, replacing its use every third hour by that of the intermittent current; rather than exhaust my patient by half-hour disturbances and injections, as has been by some advised.

After all that has been said on this subject, the essential fact is this: that plan is best which accomplishes most perfectly the cleansing of the parturient canal. With ordinary precautions, danger need not necessarily attach to any method.

3. The uterus having now been thoroughly cleansed, and the patient entirely quieted, attention should be turned to controlling the temperature, which, in septicæmia of puer-

peral character, runs so high and maintains itself at so exalted a range as to constitute one of the immediate factors of a fatal issue. Even if this were not the case, the patient's strength is so much exhausted by prolonged high temperature, her nerve power so much depreciated, her blood-state so rapidly injured, and her comfort so decidedly interfered with, that these considerations alone would point to the propriety of combating hyperpyrexia. For this purpose I formerly relied upon the affusion of cold, or tepid water, the patient lying upon Kibbee's cot; at present I accomplish the same result more easily and more pleasantly for the patient by the use of Chamberlain's rubber-tube coil, which I here show. A mat, composed of a rubber tube rolled upon itself in a circle, covers the whole abdomen from the ensiform cartilage to the symphysis pubis; the upper end of the tube which makes this mat is anchored by a weight in a tub of ice-water, placed about three feet above the level of the patient, and the lower end falls into a tub upon the floor. By siphon action the water of the elevated tub runs through the tube which constitutes the mat, and collects in the receptacle on the floor. By this means a temperature of 104° can very readily, as a rule, for there are exceptions to the rule, be kept at 100° for weeks together.

Unfortunately, there are almost insurmountable difficulties connected with the use of this invaluable method in the minds of the patient's friends, the patient herself, the nurse, and alas, too often, the attending physician. You are told that the patient becomes chilled, that the coil prevents her resting, that the temperature absolutely goes up under its use, and descends whenever it is left off; and by the doctor you are apt to be informed that his fear of resulting pleurisy, bronchitis, or pneumonia is very great.

I will merely say, in refutation of these charges, that in

my service in the Woman's Hospital, where convalescents from laparotomy are constantly under treatment in large numbers, this means of controlling temperature is as commonly and as freely in use as poultices are in general hospitals, or gargles in dispensaries for diseases of the throat. We never meet with any of these difficulties, and very rarely with failures as to the desired result, and I believe that I am correct in saying that successive house-staffs, whose duty it has been to carry out the plan, have thus far had, to a man, the most implicit faith in its beneficial agency.

There are some peculiarities about it, however, which I must mention. Very often the coil will not succeed in controlling the temperature for twenty-four hours; its prolonged use alone develops and illustrates its great benefits; and removing it from the body for an hour at a time damages its influence very much. I have never seen evil result from the chilliness which it excites, if hot bottles be kept at the soles of the feet, and in not one instance, out of hundreds of cases, have I seen pneumonia or pleurisy excited by it.

4. The nervous system should be so kept under the influence of febrifuge medicines as to keep under control the tendency to chill and pyrexia. For this purpose, fifteen grains of the sulphate of quinine should be given in capsule or by suppository night and morning, or, in place of this, two capsules may be given night and morning of Warburg's tincture, in the form of solid extract, as advised by Dr. J. T. Metcalfe. Lastly, to the same end the salicylate of sodium may be employed.

5. The patient's diet should consist entirely of fluid food, given often and in small amounts. The staple article should be milk, but animal broths and gruels may be alternated with it with advantage.

6. At the very commencement of such a case the at-

tending physician should, in the patient's interest, surround himself with efficient and abundant assistance. If he undertake to wash out the uterus every four or five hours without other assistance than that of the nurse; and if the patient is to rely for the constant attention and care, which she will inevitably require, upon one nurse, it is needless to point out that the duty of both doctor and nurse—vital duties, be it remembered—will be but half performed. And, unfortunately, the penalty will fall upon the patient and her friends.

For a case of puerperal septicæmia to be properly treated in private practice by the plan here advocated, it is necessary for the attending physician to associate with himself some young practitioner, who has the time to devote to the case, and the intelligence to use the uterine douche safely and efficiently. Furthermore, two nurses are necessary: one to be in charge for twelve hours, and the other then to relieve and replace her for an equal time. Without the rest and sleep thus afforded, no nurse taking charge of such exacting cases as these can possibly do her duty in such a way as to subserve the patient's interest. As a rule, the nurse will begin with the declaration that she is competent and willing to take entire charge; that she is one of those people who can do without sleep, etc.; and her heroic offers of self-sacrifice are hailed with enthusiasm by the terrified family. To believe in, and to act upon, this would be very foolish and very dangerous. After three nights of watching, this same nurse would snore through the hours in which her patient needed her, give the wrong medicines, mislead the doctor, allow the bladder to become distended with urine, and fail in every requirement of the occasion.

If the patient can not bear the great expense attendant upon the extra service which I have mentioned, it is her misfortune; and for such as herself the doors of our hos-

pitals are open. There is no case of ovariectomy in the Woman's Hospital, however poor the patient be, upon which, thanks to the generous arrangements of its managers, just such attendance as I have mentioned is not lavished.

The antiseptics which have heretofore been tried under these circumstances are thymol, boric acid, salicylic acid, carbolic acid, and mercuric bichloride. Of these, all have disappeared before the superior merits of the last two; and carbolic acid, which for so long a time has been almost supreme, appears about to be abolished in favor of the bichloride of mercury, 1 part to 1,000 or 2,000 of water. For all antiseptic purposes outside of the uterus, the bichloride is now, owing to the carefully made and important investigations of Koch, very generally employed in the strength of 1 to 1,000, and the uterus has now been washed out with this excellent germicide, 1 to 2,000, often enough to make us regard its use as an intra-uterine injection as entirely warrantable. If carbolic acid be used in that way, it will not be safe to carry its strength beyond a two-, or, at most, a two-and-a-half-per-cent. solution.



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