position was taken "that, inasmuch as there is no essential constancy in the clinical symptoms nor in the pathological findings of so-called Landry's paralysis, and, inasmuch as the etiology is wholly vague, it is probable that the affection does not represent in itself a process to which the term 'disease' may properly be applied, and that, therefore, it is desirable to drop the term as unnecessary and misleading." This point of view has met with doubtful acceptance. Spiller, writing in *Progressive Medicine*, finds fault with an attitude which attempts to abolish what we have, without an effort to substitute a more fitting term. Schwab³ has, in general, taken the view advocated by us. Dejerine and Thomas are inclined to regard Landry's paralysis as a somewhat undetermined series of symptoms of varied pathology, in which the peripheral motor neurone plays a predominant rôle. In a recent article⁴ Diller takes up the matter again in detail and finds much reason for retaining the term Landry's paralysis, although his somewhat involved definition of the affection leaves one in great doubt as to the clearness of the disease-picture. Diller urges that Landry's paralysis be employed as most neurologists use the term apoplexy, in other words, as a purely clinical designation. To this there can certainly be no objection, but a name so limited is of small scientific value. Terms of which apoplexy is an example are certainly being used less and less, and the pathological basis upon which such symptoms as apoplexy depend are being brought more and more into the foreground. We have no doubt that apoplexy will soon be a term used only by the laity, and not by persons whose knowledge permits them to go behind appearances to facts. It is, however, quite profitless to argue regarding a name, provided only we have a clear idea of what the name signifies; but so far as we can learn from the various papers which have appeared within the last ten or more years, there is absolutely no unanimity of opinion on this point in relation to Landry's paralysis. The attempts at definition have not helped to clear away the obscurity. One point of view will at least receive general assent, and that is that a pathological basis of classification is always more satisfactory than a clinical one, and that an etiological classification is preferable to either. In the consideration of so-called Landry's paralysis we are far from an etiological basis, and we have gone decidedly beyond a mere clinical basis. Our present duty, therefore, is to classify these diversified cases on pathological findings, provisionally reserving the clinical designation Landry's paralysis for the increasingly small number of instances in which, after adequate study, no anatomical changes are found postmortem.

OBSTETRICAL ANTISEPSIS.¹

BY WARREN R. GILMAN, M.D., WORCESTER, MASS.

It is practically impossible to find out exactly how many women die of puerperal infection in any city. There were but four deaths from this cause reported in Worcester, Mass., during the past year.

¹Loc. cit.

²Loc. cit.

³Read before the Worcester District Medical Society, March 12, 1902.

I had personal knowledge of two fatal cases, and I have no doubt whatever that the total number of fatal cases was much larger than actually recorded at the office of the Board of Health. I believe it is true that typhoid fever, pneumonia and malaria are not infrequently given as causes of death when the real cause is puerperal septicæmia.

In modern lying-in hospitals the death-rate from this cause has been reduced to a fraction of one per cent, but it remains much higher in the practice of the profession at large.

For every case of puerperal infection which terminates fatally, there are many which recover; but by the term "recovery" we must understand simply that the patients have escaped death. In very many such cases, the damage done to the uterus, ovaries, tubes and pelvic peritoneum is beyond repair, and is a cause of suffering, disability and invalidism for years or perhaps life.

It is a fact that puerperal infection is, in the general practice of the profession, the cause of many deaths, and much more frequently the cause of protracted convalescence, critical illness and permanent serious injury of the pelvic organs.

To bear out the truth of my statement that infection of obstetric cases is very common, I will quote from a recent textbook on obstetrics. The writer of the chapter on this subject says: "On the other hand, in private practice it is questionable whether the results of to-day are materially better than before the introduction of antiseptic methods. . . . It would appear to us that puerperal infection is almost as frequent in practice now as fifteen years ago, for the reason that the doctrines of asepsis have not yet permeated the rank and file of medical men, much less those of the midwives, in whose hands a very large proportion of all obstetrical cases occur."

The cause of puerperal fever is no longer unknown, for it has been proved by bacteriological work that the disease is a wound infection by one or more of the well recognized micro-organisms.

The streptococcus is most commonly the cause of the severe infections, but it has been demonstrated that nearly all the other pus-producing organisms may be and frequently are the cause of the less severe forms.

The bacillus coli communis is very frequently the infecting organism, and, as it is found normally in great abundance in the fecal contents of the rectum, it is evident that the opportunity for infection during and after labor is ready at hand. It is reasonable to ask if the infecting organism, whether it be streptococcus, staphylococcus or colon bacillus, may not be present in the vagina or uterus before labor begins and so give rise to what is called an anti-infection. A good deal of careful work has been done by competent men in the effort to answer this question, and after due consideration of the results of this work one is justified in saying that, while anti-infection is theoretically possible, it practically does not occur, and that the organisms which are the cause of infection are introduced from without during labor or soon afterward.

It is not, then, chance, luck or fate which decides whether a given patient has puerperal septicæmia; the disease is caused by definite, recognized organisms which are introduced into the genital tract by

the physician or the nurse during labor or in the days immediately following labor.

In theory, the competent and conscientious physician should have no cases of infection in his obstetric practice, but as a matter of fact they do occasionally occur in the practice of the most painstaking practitioner. There is no other one principle of so much importance in obstetrical work as that of asepsis, and I ask your attention to the consideration of what can be done during the progress of a labor case to preserve it.

Every patient should be told to take a warm bath at the beginning of labor, and to wash the external genitals carefully with soap and water. When a good nurse is in attendance and no strong objection is offered by the patient, the hair about the genitals should be cut short; in many cases, when this has not been done, the doctor can do it at a later stage without any trouble. A vaginal douche is of no use, and does some harm. Except in rare cases, the vagina is free from harmful organisms, and if such organisms were present an antiseptic douche would not destroy them; it would take long and thorough scrubbing to do it. A douche washes out the secretions of the vagina, and removes the lubricant which nature provides to assist in the passage of the head over the floor of the pelvis. When there is no such lubricant present, there is much more likelihood of tearing the perineum.

The rectum should be emptied by an enema given early in labor. A rectum distended by fecal masses retards the progress of the presenting part over the perineum. When it has not been emptied, the descending head forces out the fecal contents, and the doctor may have considerable difficulty in disposing of several small dejections without contaminating his own fingers and the bed linen.

That the sheets on the bed should be clean, and there be a good supply of aseptic or at least clean towels, goes without saying. I know very well that thousands of women have been delivered between soiled and filthy sheets and have had a normal convalescence, but there is a chance for infection under such conditions, and it should be eliminated.

If it were not necessary to make a vaginal examination of a woman in labor, the number of infected cases would be small. It sometimes happens that the doctor does not reach the patient's bedside until the head is stretching the perineum. In such a case, a vaginal examination may not be needed, but in the majority of cases, those seen at an earlier stage of labor, it is necessary to make a vaginal examination. It is important to learn the condition of the cervix or to what extent the os has dilated, and it is absolutely necessary to know that there is not a prolapse of the cord or an extremity and that the placenta is not presenting.

In the ordinary case one gets the information he wishes by a very brief vaginal examination, which needs to be repeated but a few times if labor progresses normally. The examination should never be made by passing the finger under the bed-clothes over the surface of a thigh and into the vagina by sense of touch; the external genitals should be fully exposed to view, the labia separated by the fingers of the left hand and the examining finger introduced into the vagina without touching any other part.

Prolonged and repeated examinations for the purpose of determining the position of the head by locating the sutures and fontanels is not necessary as a rule.

External examination or abdominal palpation will, in the great majority of cases, show the position of the baby in the uterus, and it is the duty of every one who practises obstetrics to perfect himself in this matter. By routine practice of the method one may acquire the ability to find out several of the most important conditions before making a vaginal examination. I find the making a diagnosis by external examination one of the most interesting features of a labor case. One makes his diagnosis of position in this way, and later, by noting the progress of labor, the position of the head when it is born and finally the external rotation of the head, confirms or corrects his diagnosis.

While I believe that infection occurs most often in the cases which are subjected to frequent vaginal examination, one should not hesitate to examine at short intervals if it is necessary. There are cases, of course, when it is necessary to do so in order to determine the rate of progress or the degree of flexion or extension of the head.

Inasmuch as one is called upon to make at least one vaginal examination of nearly every case, and sometimes has to make repeated examinations, the most important point in aseptic work is the cleaning of the hands. It is impossible to make the hands absolutely aseptic by any method, but experience shows that it is possible to make them so nearly aseptic that the examining finger does not infect the patient. Soap and water followed by corrosive sublimate solution is quite satisfactory; the hands must be scrubbed vigorously with soap and hot water and a clean brush for several minutes, and the scrubbing repeated in a 1-2000 solution of corrosive sublimate.

The cleaning of the hands in this way must be done carefully as a routine practice in every case, and must not be done hurriedly or perfunctorily. The use of the solutions of permanganate of potash and oxalic acid, although more satisfactory theoretically, is not to be urged as a necessity in practice.

Corrosive sublimate tablets should be kept in every obstetric bag, and a 1-2000 solution should be at hand during the progress of every labor case. One cannot insist too strongly or too often upon the absolute necessity of properly cleaning the hands, and any doctor who deliberately makes a vaginal examination with unclean fingers is criminally negligent. The laity are learning that it is necessary for the doctor to use antiseptic methods in obstetric practice, and I believe the time is not far distant when the man who does not use them will be liable to suit for malpractice if infection occurs. It is not difficult to clean the hands properly when only a few examinations are needed; but when one has to examine often or when the head is rapidly stretching the perineum and forcing out the fecal contents of the rectum, it is not easy to preserve a perfect antiseptic technique. It is impossible under such conditions to keep up to the standard set by a good surgical operation, but one should do his best, and never, even in the excitement which often attends the last part of the second stage, neglect his anti-

sepsis. An anesthetic at this time may not only save the perineum, but also help in maintaining cleanliness. The anus should be cleansed with a pledget of cotton or a gauze sponge wrung out of the solution of corrosive sublimate and kept covered with a towel or piece of gauze. I believe it is entirely unnecessary to put a finger or thumb into the patient's rectum for the purpose of exerting traction on the chin of the baby; the thumb placed behind the anus, between it and the coccyx, is perfectly efficient in urging the head over the perineum.

In the last part of the second stage, when one is holding back the head during pains, and finally is assisting the birth of the head during an interval between pains, it is important not to touch anything with the hands except the immediate field of operation — if I may use that term; this field of operation must be clean and the surrounding parts, buttocks and thighs, kept covered with clean towels. Towels which have been sterilized are to be preferred, but freshly laundered towels which have been kept wrapped up and undisturbed are safe enough.

Neither vaseline nor any other lubricant for the fingers is needed at any time.

The use of rubber gloves in surgical work has solved the problem of sterilization of the hands, and their employment in obstetrics is worth consideration and trial. A prolonged or even a normal labor case differs very much from a surgical operation in point of time and detail, and one cannot sit by the bedside for hours with glove-covered hands held at arms length or kept immersed in an antiseptic solution. It takes but a few minutes, however, to put on and take off the gloves, and if frequent examinations are made, they may be kept on the hands. They are particularly useful in the last part of the second stage, when one often cannot help touching unsterilized objects and cannot leave the patient to wash the hands thoroughly. The gloved hand is smooth, and much more readily cleansed than the bare hand by simple immersion for a minute in the solution of corrosive sublimate.

I have been using gloves more and more frequently during the past year, and am well satisfied with them. There are times when I still need the bare finger to distinguish accurately certain features of the head or birth canal, but I have no doubt that practice will enable me to recognize the landmarks perfectly with the gloved finger.

A napkin or pad covering the vulva should be worn during labor. Every patient should be directed to have a good supply of freshly laundered napkins on hand; still better to have several dozen sterilized obstetric pads. These pads or serviettes are for sale in dry-goods stores and can be sterilized by the patient. Common lard pails are found in nearly every house, and are convenient for this purpose; a pail is tightly packed with pads and then placed in a large tin pail containing water enough to boil for two hours. After the pads have been steamed for two hours, the lard pail may be taken out, covered and put away. Sterilized pads put up in sealed packages are sold by firms dealing in surgical supplies and dressings; they are not expensive, and save the patient or her nurse the trouble of sterilization.

It is a good rule to keep the fingers out of the vagina during and after the third stage. The placenta

is very rarely adherent, and nearly always comes away within twenty or thirty minutes. It may be necessary to assist the expulsion by Crede's method, and gentle traction on the cord after the placenta has been forced into the vagina will complete the labor. Obstetric forceps and all other instruments should be boiled just before they are used, and then kept in a clean towel or a large dish of boiled water at the bedside, within reach of the doctor. It is not enough that instruments have been boiled and made aseptic; they must be kept clean while in use and must not be thrown upon the floor or any convenient chair. An obstetric operation with the patient under the influence of an anesthetic ought to be conducted in accordance with the rules which govern every surgical procedure. Undue haste and excitement do a great deal of harm, and it is especially necessary, if the operator's assistants are not trained assistants, that he, at least, remain cool and collected.

A post-partum antiseptic douche is not called for if the delivery has been conducted aseptically, but I sometimes give a douche of hot water to stimulate a relaxed uterus which does not contract promptly. The post-partum douche given by a careless assistant using an unclean syringe may easily defeat its own purpose and infect the patient. The doctor should give the douche, and see to it that the hard rubber nozzle of the syringe has been boiled before being used. A new syringe is much to be preferred, and a long glass tube is the best nozzle; this glass nozzle may be boiled, and its length enables one to give the douche without touching the vulva.

For the first seven or ten days following delivery, the external genitals should be treated as one would treat an open wound whose dressings have to be changed frequently. The obstetric pads are surgical dressings, and should be handled with proper care. The parts to be dressed should be cleansed with a spray of antiseptic solution or wiped with antiseptic gauze or cotton wrung out of an antiseptic solution. Vaginal douches are not needed and are not to be given.

If the attendant is a trained nurse, this care of the patient may be left to her.

Unfortunately, in many cases, the attendant is not a trained nurse, but is a most dangerous and obnoxious person. I have had my share of painful experiences with such women, and I believe that many cases of puerperal infection are the result of the unclean methods practised by them. The woman of this kind, so-called nurse, is a fixture among poor people and cannot be eliminated; but much can be done to restrict her duties and to render her less dangerous. The doctor is held responsible for the recovery of his patient, and he has the right to insist, when he is first engaged, upon having as good a nurse as possible. If the need of cleanliness and the dangers of unclean methods are explained to the patient, she is interested in doing what is best for herself. I have often directed a patient to engage her untrained nurse for the eighth day following confinement and to have a trained nurse for the confinement and the first week. I have never had any difficulty in getting a trained nurse to accept such an engagement; indeed, she is usually glad of the opportunity to demonstrate to a poor woman the benefits of good nursing.

In every case in which the doctor is obliged to bear with an untrained nurse, it is his duty to give instructions as to what is to be done and what is not to be done—the latter being as important as the former. In the care of the external genitals, make her duties as few and simple as possible. She should be told to keep the napkins or pads done up in a clean towel and to use them freely. Give her tablets to make a corrosive sublimate solution, and insist that when she washes the vulva she must first wash her hands in soap and water and then in the sublimate solution. The vulva is to be washed with this solution, and a douche is not to be given.

If every doctor would take every opportunity to give these women a few, simple, concise orders as to the antiseptic treatment of a patient, some progress might be made in educating them. No doctor, however, can blame his nurse for being unclean if he does not set her a good example in his own work; if he omits important antiseptic precautions, he surely cannot preach asepsis to her with much hope of success.

The man in general practice, who sees a large number and variety of cases, both medical and surgical, should cultivate the habit of cleanliness and pay special attention to his hands. He may be called to a labor case at any hour, and the cleaner his hands are to begin with, the surer is he to make them aseptic by the proper scrubbing at the bedside of his obstetric case.

Fifty years ago, Dr. Oliver Wendell Holmes, in his essay on "Puerperal Fever as a Private Pestilence," called the attention of the profession to the fact that the fever was carried from one patient to another by doctors and nurses. He reached his conclusion by his keen power of observation. Today we know why and how the fever is carried.

The doctor who is taking care of a case of puerperal fever should use every precaution to avoid contamination of himself and his belongings. Instruments for use in such a case should be carried to the house and left there until the case is ended; the obstetric bag should not be carried to the house.

While actually engaged in any local treatment of the patient, he should be careful not to touch any article or object not in use at the time; the hands should be washed and scrubbed carefully in soap and hot water and in bichloride solution as soon as he finishes his work with the patient. In short, he should take care to contaminate nothing beside his own hands and should clean his hands properly before leaving the house. Rubber gloves are to be especially recommended for this work; they protect the hands and can be boiled in the house, ready for the following day's use.

If a doctor is called to another confinement case while he is taking care of an infected case, he has a serious problem to face.

The entire contents of the obstetric bag should be boiled, and if there is any question as to the condition of the bag itself, a new one should be purchased.

The treatment of the hands should be very thorough, and rubber gloves should be used. By taking proper care, I believe it is possible to avoid carrying the infection.

To what I have said in regard to asepsis in obstetrical practice, almost every one must assent.

But the application of the principle to every case will be said by many to be impracticable.

As a final word on this subject, I wish to say that every physician is bound to exercise at least a proper and ordinary degree of care in the practice of medicine, and if he neglects or ignores asepsis in obstetrics, he does not meet his obligations to his profession or to the community.

If the importance of providing clean sheets, towels and napkins were impressed upon women about to be confined, the requirements would be met in the majority of cases.

I believe it to be good judgment on the part of a physician, even if he be a young practitioner, to decline to attend a woman who refuses to make proper preparation for her confinement. She asks him to assume unnecessary risks, and if disaster follows, the blame is placed upon his shoulders. It would be much better for all concerned if women who are really unable to meet the modest requirements of cleanliness were advised and urged to go to a hospital for the confinement. The assurance of the best care and the comforts which a good lying-in hospital offers to such women ought to outweigh the sentiment which urges them to stay at home.

ERRORS IN THE ESTIMATION OF UREA BY THE HYPOBROMITE METHOD.¹

BY ELLIOTT P. JOSLIN, M.D., BOSTON.

The estimation of urea for clinical purposes is usually performed by the hypobromite method. This method is based on the decomposition of urea into water, carbonic acid and nitrogen by means of an alkaline solution of hypobromite of soda. The results obtained are satisfactory as a rule, but I recently observed that under certain conditions errors of nearly one hundred per cent. occurred.

These errors were brought to my notice by noting the great disparity which existed between the amounts of nitrogen and urea excreted by a patient during two days of diabetic coma.² Urea is composed of nearly one-half ($\frac{28}{60}$) nitrogen, and consequently the urea in twenty-four hours can never much exceed twice the quantity of nitrogen present in the urine during the same time. Bearing this in mind, a study of the accompanying table is interesting.

Date.	N.	NH ₃ .	Urea.	
			Braunstein's.	Squibb's.
Oct. 18	23.8	3.07	43.6	80
" 19	18.7	4.39	29.6	48

On Oct. 18, the nitrogen was 23.8 grams. The greatest possible amount of urea which could be formed from this amount of nitrogen is 51 grams. The hypobromite method with Squibb's apparatus showed, however, 80 grams urea for this same period. On Oct. 19, the urea estimated in the same way is far more than twice the amount of nitrogen for the same day. To control these results the urea was then estimated by Braunstein's process.³ This method gave results commensurate with our expect-

¹ Read at Boston Medical Library Meeting, Nov. 17, 1902.

² Joslin. For full report of case, see *Journal of Medical Research*, vol. vi, No. 2, Nov., 1901, p. 306.

³ Braunstein. *Hoppe-Layler's Zeltseh. f. phys. Chemie.* Bd. xxxi. II, 3 + 4. Dec., 1900.