where the breaches into the circulation exist, and where also are found fluids and coaguli to serve as media and nidus wherein rapid multiplication takes place. The question of prophylaxis of diseases of the female pelvic organs then resolves itself into two principal propositions: the first of which consists in the minimizing of traumatism to the genital mucosæ, and the second is the preclusion of the introduction of disease micro-organisms from the extraneous world into the hollow organs constituting the genital system.

It will be seen then that the major part of gynecologic prophylaxis rests in the degree of perfection with which the art of obstetrics is carried into practice. It is a fact beyond refutation that an enormous proportion of all gynecologic affections have their origin in the parturient act, and the week in bed that follows. Endometritis, salpingitis, ovaritis, cystitis, and nephroptosis, are some of the conditions which are often simply sequelæ to the act of parturition and the puerperal month.

So much depends upon the work of him who essays to minister to the needs of woman in the hour of travail, that it is not easy to overestimate the importance of the offices of the accoucheur in the matter of diminishing the frequency of pelvic diseases in the female. The scientific obstetrician has well accomplished his duties, so that it is no longer a question of profounder knowledge, but simply a matter of the better application of the principles already well known to the profession. Of all the members of the medical fraternity who should act with an eye to the future condition of his client, there are none upon whom this obligation should rest with greater weight than the obstetrician. The prompt application of surgical principles to the treatment of traumæ received during childbirth may avert many of the troublesome sequelæ to that act which often terminate in serious pathologic changes, and often demand radical measures for relief. It is not at all improbable that uterine cancer is frequently the result of a neglected cervical laceration. The immediate restitution of a lacerated perineum may avert the occurrence of a case of prolapsus which would require hysteropexy, or even a case of procidentia uteri with chronic endometritis and hypertrophy of the organ, which might demand hysterectomy to effect a cure. Thus it is throughout the entire catalogue of minor accidents and the corresponding surgical procedures for their relief.

There are some grave conditions which owe their inception to accidents occurring during the age of pubescence, or during the first years of menstrual life. It is here that the general practitioner might find an opportunity to enhance his usefulness at the expense of the neurologist. It is reasonable to believe that many cases of aberration of nerve function might be prevented by well-directed medical attention during the early years of menstrual life.

In sum: the prophylaxis of the diseases peculiar to woman may be embodied in a more perfect application of the principles of obstetrics in actual practice; a profounder understanding of the accidents occurring so frequently at the age of pubescence, and finally greater attention to the hygienic regulations which should govern daily life.

Radiographs of Encapsulated Trichinæ.—Radiographs of encapsulated trichinæ in the muscle of a cadaver have been secured at Würzburg, the birthplace of the Röntgen ray.

GONORRHEA AS A FACTOR IN PUERPERAL FEVER.

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The methods which have revolutionized modern surgery as the direct results of the teachings of Lister have been more or less efficiently carried out in the practice of modern obstetrics. The new science of bacteriology and the accumulating evidences of the pathogenic nature and far-reaching effects of certain micro-organisms have invested the subject of the prophylactic, aseptic and antiseptic protection of the parturient with increasing interest and importance. Notwithstanding the advancements along these lines, the query arises, why is there not greater freedom from septic complications and fatal issues in the service of those who carry out the most approved measures in the practice of midwifery? In other words, are there not frequently sources of danger within the mother herself, antedating childbirth, which ordinary methods fail to avert? I desire to emphasize the importance of these vital questions.

Since the discovery of the gonococcus which Neisser announced as the specific cause of gonorrhea, in 1879, two important discoveries have placed his claims beyond all cavil; first, the Gram method of staining, by which this germ is differentiated from all other diplococci, and, second, the improved culture methods of Bumm and Wertheim (1889-1891), by which its true specific character was established by the four immutable laws of Koch. It is now possible to scientifically demonstrate the multiple roll of this ubiquitous germ in its capacity for pathogenic mischief. A glance at the biology of the gonococcus will help us better to comprehend its possibilities for doing harm in the puerperium. Its habitat is the mucosa and glands of the genito-urinary organs of the human race. It is not known to exist anywhere in nature apart from the human body. It perishes quickly when removed from its host. It is cultivated with difficulty on nutrient media of human blood serum or urine. It dies very soon in water, loses its virulency when thoroughly dried, and is easily destroyed by ordinary antiseptics. Notwithstanding all this, the germ is most persistent in its normal surroundings. It is able to exist in various degrees of chronicity for indefinite periods of months or years, retaining its power to invade new territory and regain its old-time activity under favoring circumstances. It requires no solution of continuity or lesion of any nature to prepare the soil for infection. It is able to penetrate readily the epithelial, follicular and glandular structures of the mucous surfaces everywhere. Nor does it stop here. It also penetrates the submucosa and adjoining muscular walls. It makes its destructive pilgrimage through lymph channels into the circulation itself, and sets up dangerous lesions in distant organs, like the heart, brain and articulations. This power of extending its field of operation by penetrating almost every tissue of the body, together with its persistence in favorite localities while awaiting its opportunities, constitute its most dangerous properties as a pathogenic organism in childbirth.

Again, it is essentially an irritant pus germ. Its

advent upon uninfected mucosa is quickly followed by copious, purulent discharges in which at first no other pathogenic germs are found. It is not self-limited and hence immunity is never established, although degrees of tolerance in the form of chronic pathologic changes in members may exist for indefinite periods. According to Finger and others, the nature of the epithelium of the mucosa has an important bearing on the behavior of the gonococcus. The germ remains superficial on mucosa covered with squamous epithelium, but it quickly penetrates into connective tissue under cylindrical epithelium. He found that injections of pure cultures into the peritoneum and joints of animals produced rapid and acute inflammations, while injections of filtered culture-fluids gave negative results; showing that the pathogenic effects were caused by the living germ itself and not by its products. Hence we may readily understand its ability to produce abscesses wherever swollen ducts, canals or tubes hinder free drainage or where trauma has given it entrance to the systemic circulation. Bujwid has reported the case of a gonorrhoic male who was seized with a chill two days after catheterization. These chills were repeated several times in the next ten days, followed by intramuscular abscesses in various parts of the body, the pus from which afforded pure cultures of the gonococcus; thus, showing its ability to produce pyemic conditions. Not only is it a source of danger in itself, but its presence prepares a suitable field for the culture of other germs, even more dangerous in the presence of the slight or severe trauma of parturition. The lowered vitality of infiltrated mucous and submucous structures, the hypersecretion of mucus, the debris of swollen and exfoliated epithelium offer a most favorable soil for mixed infection. The gonococcus will share its possessions in apparent harmony with other pathogenic germs, or, at an indefinite period, quit the claim in their favor. We believe these facts are overlooked in estimating the rôle played by the gonococcus in childbed fever. We have developed slides from a case of chronic gleet in a patient suffering from arthritis of the knee, two years after his acute infection, in which the pus-cells contained gonococci, while the field surrounding these cells was filled with staphylococci. We have found the same microscopic showing in discharges taken directly from the cervix uteri of a patient suffering from her first attack of salpingitis, four years after her primary infection by her husband and three years after her only confinement, at which time she suffered from febrile arthritis of the shoulder, her babe having gonorrheal ophthalmia at the same time. Pyosalpinx and a laparotomy are probabilities in her future history. It is to be hoped she is now permanently sterile. In the gonorrhoic female sterility is a conservative process, a blessing in disguise.

Having reviewed some of the most important characteristics in the life history of the gonococcus, let us examine the opportunities it has for complicating and endangering the puerperal state. It has been variously estimated that from 10 to 30 per cent. of all women became gonorrhoic. I believe the latter figure is nearer the truth. This is better understood when we consider that the majority of males become infected sooner or later, and that the greater portion of them remain in uncured chronic and latent stages for indefinite periods, during which time they are capable of imparting the disease. Indeed, the proportion of

both sexes who never are completely cured is much larger than is commonly supposed. It is doubtful if chronic or residual gonorrhea in the female, by reason of its inaccessible location, is ever completely cured during her child-bearing years. If the disease were confined to the vaginal mucosa, lined as it is with squamous epithelium, it would remain superficial, as Finger has pointed out, and would be accessible to antiseptic treatment. In its urethral and vulvar locations it could be readily dislodged also, but we must remember its predilection for the ciliated, columnar epithelium of the endocervix, endometrium and fallopian tubes, and its rapid penetration of this kind of epithelium to deeper structures. Fournier's statistics show that one-fifth of all women contracting gonorrhea develop salpingitis. If this be double, sterility is usually entailed (Terillon). The radical cure of such a state is an almost hopeless problem.

Wertheim, discussing endometritis before the German Gynecological Society said, "Next to the urethra, the uterus is the favorite seat of gonorrhoic infection. It is directly infected and may be confined to that organ. It exists as an interstitial endometritis. Krönig found gonococci in many examinations of the lochia along with other pathogenic micrococci, especially strepto- and staphylococci." He concludes that gonorrhea extends to the endometrium during the puerperium, and may give rise to fever without a trace of mixed infection.

At the puerperium the disease may be recent, in the form of acute or subacute urethritis or vulvovaginitis, or it may have existed in chronic forms a long time in such favorite localities as the glands of Bartholini, in the columnar epithelium and glands of the cervix, or having preceded conception, there may be a chronic gonorrheal salpingitis or unilateral pyosalpinx. Fehling observes that gonorrhoic endometritis and perimetritis in pregnancy is now an established fact, and urges careful treatment of women who have been infected during or after conception, to prevent symptoms of a still graver character. Max Madluer demonstrated the ability of the gonococcus to pass from the endometrium into the uterine muscles and set up inflammatory processes. This, he says, is especially the case in the puerperium, and may result in abscess formation. Infection of the peritoneum through the uterine wall is a possibility, and, he believes, explains the fact of perimetritis without implication of the adnexa.

Fehling says absorptive fever is not rare in patients suffering from gonorrhea during pregnancy, and pustules are often noted. In such a state of affairs parturition opens up many channels for infection and constitutional symptoms of varying degrees of sepsis. A ruptured perineum, a vaginal erosion, a lacerated cervix, a denuded placental site, are so many open gates for the invading gonococcus or for other dangerous germs, which might not have been present but for a soil rendered favorable by gonorrhea. If pyosalpinx exists, the condition is fraught with the gravest possible dangers, which human skill may be powerless to avert. It is evident, then, that many mothers run the gauntlet of hidden, and oftentimes unsuspected, foes during confinement on account of gonorrhea alone.

DIAGNOSTIC POINTS.

If possible, an early examination should be made of every prospective mother, especially if she be a

primipara, for the reason that this class is in the greatest danger, because of more recent infection and less constitutional tolerance of the germ. 1. Any muco-purulent discharge from urethral, vaginal or cervical orifices should be regarded with suspicion and should be submitted to microscopic proof and treated according to findings. 2. The existence of a vulvar abscess or the discharge of pus from a Bartholinian gland on pressure is presumptive evidence of gonorrhea. 3. The presence of gonorrhoeic ophthalmia in the new-born is positive proof of maternal infection. If the mother be a primipara, she will be extremely fortunate if she escapes puerperal complications. 4. The presence of arthritis with pyrexia during gestation or during the puerperium makes the diagnosis of gonorrheal infection highly probable. Gonococci have been found frequently in inflamed joints as the active cause of irritation, swelling, pain and fever, which are the expressions of a systemic infection, erroneously styled gonorrheal rheumatism. I have seen acute febrile arthritis in the seventh month of pregnancy, which was not correctly interpreted until it occurred in childbed, without any pelvic symptoms whatever. Gonorrheal ophthalmia in the babe, however, cleared up the nature of the ante- and post-partum arthritis of the mother.

In a series of cases reported to this section by the reader at the Atlanta meeting of 1896, there were three fatalities after perfectly normal labor in primipara, in which gonorrhea was a clinical feature during pregnancy. In one of these sepsis developed twenty-four hours after delivery, from the discharge of an extremely fetid tubal abscess into the uterus, when the detached secondines had freed the uterine orifice, resulting in general peritonitis and death on the seventh day. The second died from recurring pelvic peritonitis and exhaustion one month after confinement. The third, with no pelvic symptoms whatever, developed multiple arthritis with hyperpyrexia and acute systemic infection, which terminated her life on the twenty-seventh day, possibly from ulcerative endocarditis. Of the non-fatal cases, the mothers all had either acute metritis or arthritis, or both, with chills and pyrexia, and all of the babes had ophthalmia microscopically shown to be gonorrhoeic.

TREATMENT.

1. *General prophylaxis.*—Prophylactic measures are of the greatest importance. These may be: 1. Educational. Our youths should be instructed at the proper age in our public schools concerning sexual physiology, sexual hygiene and sexual morals. 2. Executive; through the sanitary supervision of all classes and individuals liable to spread gonorrhoeic infection. 3. By legislative enactments, regulating the marriage license. We believe that no candidate for marriage should receive a license who has not filed a certificate of health from a competent medical official showing freedom from all contagious diseases.

2. *Specific prophylaxis.*—Once a female is known to be infected with gonorrhea, her treatment should be conducted even more persistently and more carefully than in the male, for the infection more readily passes to inaccessible locations and the remote effects are far more subversive of health and dangerous to life itself. It is unfortunate for women that gonorrhea is so often overlooked in their sex in its acute and subacute stages. Undoubtedly if it were recognized and some sort of antiseptic treatment insti-

tuted as early and universally as in the male sex, many disasters would be averted. The plan of treatment depends upon location and the stage of the disease. So long as it has passed no farther than the urethra, vulva and vagina and their special glands, drainage and irrigation with solutions of silver or potassium permanganate are effective. If the endometrium is involved without tubal infection, curettage and irrigation may cure. If the tubes are infected, as evidenced by acute or chronic salpingitis or pyosalpinx and recurring pelvic peritonitis, no local treatment can eradicate the disease. If, now, infection has taken place at the time of or during the term of gestation, much may be done to avert childbed complications. Every pregnant woman should be carefully inspected at least a month preceding childbed. Her physician should know of the sanitary condition of her parturient canal and relevant organs in order that her puerperium may be free from all preventable dangers. Inspection of parts and microscopic examination of suspicious secretions from urethra, vulvar glands, vagina or cervix uteri will determine the question of infection. Urethral or vaginal irrigation of potassium permanganate solution, 1-2000, drainage, curettage or dissection of infected vulvar glands and topical applications of nitrate of silver solution, 10 per cent., to the endo-cervix will place a patient in the most favorable condition for her confinement.

3. *Child-bed treatment.*—Ante- and post-partum diagnostic symptoms of gonorrhoeic infection have already been given. Now, that such a contingency exists, what should be the treatment in child-bed? Vaginal irrigations of sterilized water or antiseptic solutions after normal labor have been generally abandoned by obstetricians, for obvious reasons. Labor complicated by pre-existing gonorrhoeic infection is not a normal state, and I believe justifies the irrigation of the vaginal canal twice daily with warm potassium permanganate solution, 1-2000. The procedure is devoid of danger and may prevent extension to the endometrium appendages and the pelvic peritoneum. In the event of symptoms showing endometritis, intra-uterine irrigation carefully done with the same solution has given good results and I believe is rational treatment. Other external local applications and internal systemic treatment for depletion, sedation and elimination will suggest themselves according to the exigencies of the case. In the fulminating forms of puerperal fever, little can be done. If these are due in any way to gonorrhea, it is from secondary mixed infections of virulent types made possible through previous gonorrhea. Here the antitoxins are on trial with some promise of success.

CONCLUSIONS.

1. Gonorrhea is a widely disseminated disease, especially persistent and dangerous in females.
2. Gonorrhea is directly or indirectly a factor in puerperal sepsis, and accountable for a larger percentage of complications and fatalities than commonly supposed.
3. Prophylactic measures, general and specific, are most important in averting the septic dangers of childbed.

Antiseptics and Diphtheria Toxins.—Salkowski states that guinea-pigs survive fatal doses of diphtheria toxin if salicylaldehyd, carbolic acid or formalin be combined with it. The toxin seems to be chemically rather than mechanically affected, and the body temperature is evidently a factor in the result.—*Munich Med. Woch.*, June 28.