

obligation of the physician to the laity and to his collaborer, the pharmacist, is equally necessary. I very much doubt if the majority of practicing physicians have any accurate knowledge of what the U. S. Pharmacopeia is. I doubt if one in fifty physicians have either the Pharmacopeia or a dispensatory on their shelves.

Ignorance must breed disuse. I believe that there are still many errors in the Pharmacopeia. For instance, I can imagine no good reason for the insertion of the formula for the clay poultice; certainly the mixture is useless, and it would appear to give the manufacturing firm a good basis for recommending its use, because it is now official. Like remarks can justly be made of the compound powder of morphin and the compound acetanilid powder. There are about 1,000 remedies in the Pharmacopeia; of these sixty-eight are compounds. If these compounds are examined it will be seen that while they comprise but 7 per cent. of all the remedies in the Pharmacopeia, they are, for the most part, rational; that is, they are not of the conglomerate class that I have quoted. All the teachings of this book and of the dispensatory point to the proper method of using drugs, viz., either singly or in such a simple combination that the one will not antagonize the other, but may actively help. These two books, therefore should be on our shelves; the doctor should familiarize himself with their contents and use them, rather than rely on manufacturing firms for his combinations, or combine for himself a senseless lot of drugs. The little volume, "New and Non-Official Remedies," published by the American Medical Association for the Council on Pharmacy and Chemistry, should be of great value to practitioners of medicine. The Council on Pharmacy is composed of learned, hard-working men, illy-paid for their labor. Sollmann¹ gives a warning, however, when he says that the rules for admission of preparations to the pages of the report should be made more exacting.

I feel that it would work vast good if compound prescriptions, mere pharmaceutical mixtures, like the one quoted, were omitted. The following is another example of what seems to me an error:

ELIXIR VIBURNI COMPOSITUM (STEARNS).

An elixir each 30 c.c. (one fluidounce) of which is said to represent: Blackhaw, 2.6 gm. (40 grains); cramp bark, 2 gm. (30 grains); squaw vine, wild yam, Jamaica dogwood and saw palmetto berries, of each 1.3 gm. (20 grains); pulsatillo, 0.65 gm. (10 grains), in a menstruum containing 17 per cent. of alcohol.

The admission of such mixtures, it seems to me, must bring discredit on the book and work harm to the Council.

What is the active principle or the physiologic actions of a single one of the drugs in the compound? Unfortunately there are many such articles admitted. They, one and all, violate the principle, the sound practice, of prescribing only drugs of which we know something singly or in simple combination. The Council of Pharmacy through its publications must teach physicians what *not* to use as well as what articles are useful.

The pharmacist can help or hinder the physician in his aim toward correct prescribing.

First, he must be a learned compounder of drugs, a graduate from a reputable school of pharmacy.

Second, he must not do counter prescribing. He must by argument with both physician and laity, and

particularly with the latter, teach that ready-made formulas are as a rule not desirable. His arguments will have great weight.

Third, he must absolutely never recommend ready-made formulas for any disease. As rapidly as possible pharmacists should rise to the position of drug compounders only and keep no patented or proprietary remedy in their shops.

CONCLUSIONS.

Physicians should use simple drugs or simple combinations of drugs of known value directed to the condition found.

Pharmacists should confine themselves to drug dispensing and discourage self-medication by the laity.

189 Green Lane (Manayunk).

Original Articles

DIPHTHERITIC GENITAL INFECTION SIMULATING PUERPERAL FEVER.*

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The gravity of puerperal fever, its widespread prevalence, and its persistence in spite of all the safeguards thrown about the puerperal patient by the adoption of modern aseptic precautions, make any addition to the literature of this subject acceptable.

It is, unfortunately, the almost universal custom to call every septic fever occurring during the puerperium "puerperal fever," and this arises from the fact that bacteriologic examinations are not made often enough to determine the exact cause of the fever, and thus properly to classify the variety of the disease. In the light of our present knowledge, it is as manifestly improper to call a diphtheritic genital infection in the puerperal woman "puerperal fever" as it would be to call a malarial infection occurring during the same period by a similar name.

We know that true puerperal sepsis is one of the most fatal infections we are called on to treat, while diphtheritic infection, if recognized early, is one of the most hopeful. Early recognition of the disease by bacteriologic examination, and the resort to anti-diphtheritic serum should enable us to cure every one of these cases, and thus contribute materially to the reduction of the mortality at this critical period of woman's life.

The puerperal infections are best classified etiologically by Dr. C. S. Bacon,¹ of Chicago, as follows:

1. Streptomycosis and staphylococcosis (true puerperal fever).
2. Colon bacillus infection.
3. Pneumococcus infection.
4. Diphtheria.
5. Gonorrhea.
6. Sappremia.
7. Puerperal tetanus.
8. Mixed infections.

All the older text-books on obstetrics mention diphtheria as a not infrequent cause of puerperal fever, but as they antedate the discovery of the Klebs-Loeffler

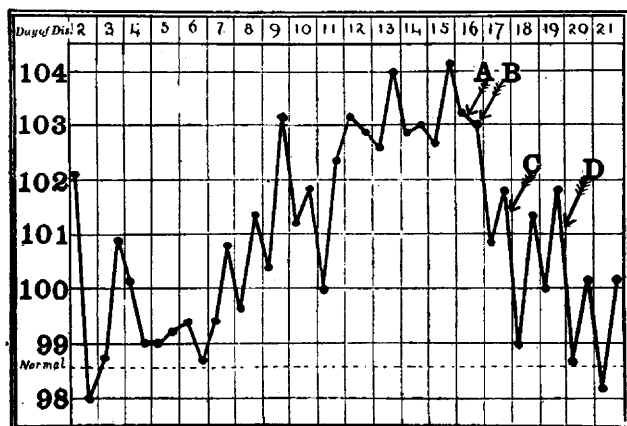
* Read in the Section on Obstetrics and Diseases of Women of the American Medical Association, at the Fifty-ninth Annual Session, held at Chicago, June, 1908.

1. Bacon, C. S.: Lectures on Obstetrics.

bacillus, they make no mention of any cultures, consequently the conclusion must be drawn that not all the exudates which they describe were due to that particular germ. It is well known that not all those cases in which there is a grayish or yellowish membrane lining the vagina, covering the cervix or spreading over the torn surfaces of the perineum, and which leave a bleeding surface on removal are true diphtheria. The investigations of Bumm and Widal have shown that the majority are due to a superficial necrosis, caused by the streptococcus alone or in conjunction with other organisms, usually saprophytes. We must not be led into the belief that a puerperal woman with an exudate in her throat and also on her genitals is suffering from diphtheritic infection; but only after cultures have been made from the genitals and the Klebs-Loeffler bacillus demonstrated are we justified in resorting to the diphtheria antitoxin treatment.

Erich Martini² states that the first definite report confirming the presence of bacteria in the blood of patients suffering from puerperal fever dates from the year 1869. Coze and Feltz³ demonstrated streptococci (chain bacilli), and by subcutaneous injection succeeded in fatally infecting a guinea pig. They failed to procure pure cultures, however.

In 1872 Waldeyer⁴ described spherical bacteria



Temperature chart in a case of diphtheritic genital infection simulating puerperal fever. A, antitoxin administered, 3,000 units; B, antitoxin administered, 3,000 units; C, antitoxin administered, 2,000 units; D, antitoxin administered, 2,000 units.

(cocci), which he demonstrated in the diphtheritic exudate or membrane from the uterine mucosa of four patients who died from puerperal fever. He also demonstrated their presence in the puriform masses of the uterine lymph vessels and ligamentum lata, in the peritoneal exudate—in the liquid as well as in the pus flakes—and once, also, in the pericardial fluid. In all his cases the bacteria were located outside of the pus cells. The pure culture of these bacteria was affected after Koch had solved the problem of pure culture. Czerniewsky was the first to succeed in obtaining pure cultures of the exciting cause of puerperal sepsis; in this manner he was able to demonstrate the presence of streptococci in the lochia of mild and severe cases of puerperal fever.

Comparatively few cases of diphtheritic fever are on record, and all writers regard the condition as a serious one. It was not until 1895 that true diphtheritic fever

during the puerperium was demonstrated by the culture of Klebs-Loeffler bacillus, and its treatment by anti-diphtheritic serum instituted.

The following table summarizes the reported cases:

LIST OF REPORTED CASES.

Author.	Admin. diph. anti-toxin.	Bacillus demonstrated.	No. of cases.	Result.
Bumm ⁵	Yes	Yes	1	Recovery.
Nisot ⁶	Yes	Yes	1	Recovery.
Haultain ⁷	Yes	Yes	1	Recovery.
Longyear ⁸	No	Yes	1	Recovery.
Longyear ⁹	No*	Yes	1	Death.
Longyear ¹⁰	Yes	Yes	1	Recovery.
Longyear ¹¹	No	Yes	1	Recovery.
Longyear ¹²	Yes	Yes	1	Recovery.
Longyear ¹³	Yes	Yes	1	Recovery.
Jacobs ⁹	Yes	Yes	1	Recovery.
Williams ¹⁰	Yes	Yes	1	Recovery.
Clark ¹¹	Yes**	Yes***	1	Recovery.
Favre ¹²	No	Yes	1	Recovery.
Plassetzky ¹³	Yes	Yes	1	Recovery.
Lop ¹⁴	Yes	Yes	1	Recovery.
Orband ¹⁵	Yes	Yes	1	Recovery.
Ungara ¹⁶	Yes	Yes	2	Recovery.
Raw ¹⁷	Yes	Yes	3	2 recoveries
Fitzgerald ¹⁸	No	No	1	Recovery.

* Antistreptococcus serum used.

** Double serum used.

*** Staphylococci also found.

J. Anderodias states that Mahieux, in 1857, published an observation of a gangrenous diphtheria occurring in a recently delivered case which was transmitted from the mother to the infant. This diphtheritis was carried from the uterus to the mouth, affecting the infant also, and terminating in the death of both.

There is little doubt from his report that these cases were due to infection by the bacillus of Loeffler, although this bacillus was at that time unknown.

Hervieux published a case in 1866¹⁹ which was evidently true diphtheria, but here also the science of bacteriology had not been developed.

In 1885 Garrigues²⁰ published an article on puerperal diphtheria, in which he describes the appearance of the diphtheritic exudate occurring in the genital region of recently delivered females. His observations are based on 29 cases. As diphtheritic cultures were not made, it is, of course, impossible to state whether they were all purely diphtheritic or not.

I present the following case:

Patient.—Mrs. M. K., Irish, aged 37, housewife.

History.—Patient had had no serious illness since childhood, but had been pregnant four times. Her last pregnancy required instrumental interference, but there was some edema during all four pregnancies. She had had no miscarriages or abortions. During the present pregnancy there had been some headache and emesis. Had been a moderate edema of the face and extremities during the last three months. The urine had been diminished in quantity and muddy in appearance.

Labor.—Labor came on at 5 a. m. June 21. The pains, at first weak, became very strong, but the patient was not able to deliver the child. She had two convulsions during the day. Forceps were applied at 2 p. m., but the attending physicians were unable to effect delivery. Patient who was delirious was admitted to the obstetric service of St. Luke's Hospital at 11 p. m. of the same day. Examination revealed a very extensive

5. Bumm, E.: Ztschr. f. Geburtsh. u. Gynäk., 1895, xxxiii.

6. Nisot: Bull. Soc. belge de gynéc. et d'obst., Brus., viii.

7. Haultain, F. W. N.: Lancet, London, 1897, 1.

8. Longyear, H. W.: Am. Jour. Obst., 1897, xxxvi.

9. Jacobs: Jour. d'anat., Dec. 12, 1897.

10. Williams, J. Whitridge: Am. Jour. Obst., 1898, xxxviii.

11. Clark: Boston Med. and Surg. Jour., 1898, No. 2.

12. Favre, A.: Ann. Soc. obst. de France, 1899.

13. Plassetzky, A.: Ejened. jour. Prakt. Med., 1900, vii.

14. Lop: Vull. Soc. d'obst., Paris, 1904, vii.

15. Orband: Allg. Wien. med. Ztg., 1906, ii.

16. Ungara, V.: Rassegna d'ostet. e ginec., 1906, xv; Centralbl. f. Gynäk., Jan. 18, 1908.

17. Raw: Jour. Obs. and Gynec., 1905, v.

18. Fitzgerald, Brit. Med. Jour., ii, 1895.

19. Hervieux: Gaz. d. hôp., 1866, xxxix.

20. Garrigues: New York Med. Jour., 1885, xlii, 354.

2. Martini, Erich: Deutsch. med. Wchnschr., 1905, xxxi.

3. Coze and Feltz: Gaz. méd. de Strasbourg, 1869.

4. Waldeyer: Arch. f. Gynec., 1872, iii, No. 2.

edema of the entire body, especially noticeable at the umbilicus and external genitalia. The umbilical cord was prolapsed and pulseless. Fetal heart tones and uterine souffle could not be heard. The position of the child was left occipito-anterior. The cervix was partially dilated. The patient was anesthetized and a craniotomy performed. The placenta was removed by expression, after which an intrauterine douche with sterile water was given. The fetus was a male, weighing ten pounds, was full term and not macerated. Two hours subsequent to delivery the patient had a severe convulsion, which lasted five minutes. This was followed in four hours by a second convulsion, which lasted three minutes. The patient became rational nine hours after delivery and did not again lose consciousness. At this time there were emesis, involuntary passage of feces, and incontinence of urine. The first specimen of urine was obtained by catheter at the time of admission. It contained albumin, blood and granular casts. The first twenty-four-hour specimen also contained the above, was acid in reaction, and had a specific gravity of 1018. The quantity of urine was small. On the first day there was a leucocytosis of 17,500.

Treatment.—The early treatment was directed against the nephritis. It was as follows: Potassium acetate, grains 15, every four hours; calomel, grains 5, followed by elaterin, grain 1/30, all in broken doses; sweats and rectal injections of physiologic salt solution with coffee. Four days after delivery the involuntary passage of feces and incontinence of urine ceased; the edema became greatly reduced, and the patient felt much improved. June 30 there was a slight chill, followed by emesis. July 2 the case was diagnosed and treated as "septic peritonitis," and the patient was transferred to the gynecologic service, when she came under my care. Vaginal smears were made, and these contained many bacilli, whose protoplasm stained unequally. No cocci were present. A slight membrane was visible in the vagina at this time. The patient was free from pain, but was restless and there was some twitching of the fingers. She had occasional emesis. Smears were again made on July 4, and the same irregularly staining bacilli were obtained from the vagina; these were not present in smears made from the uterine discharge. Cultures from the vagina were made on Loeffler's medium. In twenty-four hours there appeared colonies of the diphtheria bacillus. Smears showed the same bacillus, which were present in the vaginal secretion. Three thousand units of diphtheria antitoxin were administered, when the temperature fell from 40.1 C. (104.2 F.) to 39.4 C. (103 F.) by the following day. Three thousand units more were given and the temperature fell during twelve hours to 37.9 C. (100.3 F.). Forty-eight hours later the temperature was above 37.8 C. (100 F.), two thousand units were given and the temperature fell that evening to 37.2 C. (99 F.). During the next three days the temperature varied, reaching 38.5 C. (101.3 F.) the evening of the third day. The following morning 2,000 units more were injected and the temperature fell to 37 C. (98.6 F.) that night. It fluctuated slightly during the next three days, reaching 37.8 C. (100.1 F.), but fell to normal by the morning of the fourth day. The patient received in all 10,000 units of antitoxin.

July 6 vaginal examination was made under anesthesia and the following record made: "A dull-gray membrane, with slightly elevated margins, is seen just inside the introitus. It extends upward toward the cervix. The membrane is in the form of scattered patches, the largest of which lies to the right of the anterior column; the mucous membrane at the margins of each patch has an angry appearance: at one point near the vulva is an irregular gangrenous area. There is a dense membranous patch, one centimeter ($\frac{1}{2}$ in.) in diameter, on the anterior vaginal wall. When this is removed there is some oozing of blood from the denuded surface. Around the cervix is a dense membrane, and here, at the site of a recent cervical laceration, is also found a markedly gangrenous area."

Later History.—An intrauterine douche of sterile water was given at this time, but only a few fibrous threads came away; a single strip of iodoform gauze was inserted into the uterus. The tincture of the chlorid of iron was given in glycerin, and vaginal douches with protargol and Thiersch solutions em-

ployed. July 7 the pulse was weak and the patient was prostrated; she could move her limbs only with the greatest effort. A second intrauterine douche was given, and, as before, nothing came from the uterus. July 8 the condition of the vagina was much improved. The membrane was fast disappearing, and the marginal mucous membrane had lost its angry appearance. The pulse remained weak, and camphor in oil was given hypodermically, 2 grains every three hours. There was a slight discharge of blood from the vagina on July 9 and 11. The diphtheria bacillus had disappeared from the vagina by July 13, and the site of the former membranes now appeared like a very superficial erosion.

The patient made a slow and uneventful recovery, and was discharged in good condition August 7, seven weeks after admission. Cultures of the Klebs-Loeffler bacilli from this patient proved fatal to a guinea-pig, and pure cultures of the germ were then made from the animal, proving beyond all doubt the exact nature of the infection.

Foulerton and Bonney,²¹ on investigating puerperal infections, state that in seven cases a diphtheroid bacillus was found in the uterus. The characteristics of the diphtheroid bacillus taken from two cases showed it to be morphologically undistinguishable from the *Bacillus diphtheriae*, but that it otherwise presented the following points of distinction:

1. It did not produce any acid in glucose peptone broth after six days' incubation, at a temperature of 37 C. (98.6 F.).

2. It was non-pathogenic for the guinea-pig.

They found a "similar diphtheroid" bacillus in the cervical secretions of non-pregnant women, but it seems probable that in the two cases of puerperal fever in which it was found the organism was present in the pathogenic capacity. The bacillus described is possibly the same species as that found by Halle in the vagina, and believed by him to be the pseudodiphtheria bacillus of Weeks. They say further, "that it is on record that the *B. diphtheriae* has been found several times in the uterus or in the vaginal lechia, but, so far as they can ascertain, the description of the bacillus found in these cases would apply to the 'diphtheroid' bacillus equally as well as to the true *B. diphtheriae*."

In spite of these researches, and bearing in mind the excellent results obtained from the use of the anti-diphtheria serum, where the bacillus diphtheria has been demonstrated by culture, I do not think it necessary to resort to the inoculation of a guinea-pig, except in those instances in which such a procedure is entirely feasible.

Most of the case reports show that active local antiseptics was instituted by means of the vaginal douche containing mercuric chlorid, iodine solutions, or other powerful agents. The general experience in the use of diphtheria antitoxin would seem to prove that these measures are unnecessary, a simple boric acid douche for cleansing purposes being the only thing required.

The diphtheria invasion does not seem to have any definite period after confinement for making its appearance, the time varying from the third to the twenty-sixth day. Pain in the genitals is apparently one of the prominent symptoms.

The membrane covering the genitals is grayish-white in color, with a red coloration around the edges. In all but one of the reported cases its appearance was accompanied by fever, ranging from 37.8 C. (100 F.) to 40 C. (104 F.), with a corresponding acceleration of the pulse.

All of the patients recovered in those cases in which the antitoxin was used. Every puerperal woman devel-

21. Foulerton and Bonney: *Lancet*, London, 1905, 1.

oping a fever, more especially where a membrane has made its appearance, should have a bacteriologic examination made from the genitals, and the variety of the infection classified.

Welch, of Johns Hopkins, says: "The efficiency of the antitoxin treatment has passed beyond the experimental stage, and is settled beyond all doubt." The initial dose should not be below 1,500 units, if the infection is evidently a mild one. I believe, however, we would get quicker results if we were to commence with 3,000 units, to be repeated in six to eight hours, if no improvement is manifest. When enough of the serum has been given, the membrane shrivels, the pulse becomes stronger, the temperature falls, and the general condition of the patient is improved.

After the favorable experiences in the use of the diphtheria antitoxin serum in the cases reported, there is no doubt that in all patients suffering from diphtheritic puerperal infection, where the Klebs-Loeffler bacillus has been demonstrated, diphtheria antitoxin is a specific for the disease. Curettement, either with a sharp or dull curette, or with the finger, should be scrupulously avoided, as, the membrane being densely adherent, its removal results in leaving raw surfaces which serve as open avenues for the absorption of a greater amount of toxic material.

I wish to acknowledge my indebtedness to Dr. Charles P. Clark, for his painstaking attention to the details of the bacteriologic of this case.

DISCUSSION.

DR. A. BELCHAM KEYES, Chicago: Years ago I started in general practice. I have many records in my office of faucial diphtheria in which the temperature was absolutely normal and other cases with a temperature of 99.5 to 100 F. in the most malignant faucial diphtheria. Uterine diphtheria should not necessarily differ in this regard from the faucial; neither one presents any chill, there being a *schleichende*, creeping, insidious onset and only a moderate rise of temperature of, say, one or two degrees, unless there is mixed infection, when the temperature may reach 104 or 105 F. From the history of Dr. Cuthbertson's case I should say that this was a mixed infection. It seems to me that we should not wait for the culture in suspicious cases, whether mixed infection be present or not. I believe that this is a very important point. Diphtheria antitoxin should be injected first and the infection proved by the microscope afterward. I believe that a larger amount of antitoxin should have been used at once. Some years ago we gave smaller amounts. To-day we give 10,000 units at once, without waiting; indeed, we may give large amounts like this to very small children. Therefore we should not hesitate in the case of a puerperal woman. A point of special interest in the paper relates to the carefulness with which the bacteriologic work was carried out. As Dr. Cuthbertson said, we have much data on puerperal fever as a general infection during the puerperium, but we have very few true data compared to the number of patients who have died of the actual bacteriologic infection of these cases. To treat them intelligently in the future I think we should be extremely careful concerning the bacteriologic findings.

DR. A. ERNEST GALLANT, New York: The subject is one of great interest to those who see many cases in consultation and from the standpoint of the man who is not in the place where the bacteriologic examination can be quickly made. If we wait until the bacteriologic report comes to us, we shall have lost a golden opportunity. Some years ago, before the days of antitoxin, I was in an institution where there were 400 children, among whom there were a large number of diphtheritic cases. I saw various experiments and methods employed in treating the disease, and I could not help smiling when I remembered the plan told to my mother by a neighbor when we had diphtheria in the house. One child was ill with diphtheria and six had sore throats. A neighbor advised my mother to use powdered sulphur blown into the throat through a glass tube. The child not so treated died and the rest recovered without diphtheria. I have tried the same experiments in New York City, sending specimens to the Board of Health and having the report returned of diphtheria. After I applied the sulphur it was impossible to find a trace of the diphtheria bacilli. The point is, that in the case of membrane vaginitis, either post-partum or otherwise, I should not wait for the bacteriologic report, but would apply the powdered sulphur in this way. After that no bacteriologist could find any diphtheria germs. It is especially valuable, when using the sulphur, to insert a roll of gauze as a wick. The temperature usually returns to the normal within thirty-six hours. I recall one case in which the entire vagina was one cylinder of black exudate. The sulphur treatment was the only one carried out, and the next day the temperature was down to normal. The French use powdered sulphur in the treatment of diphtheria, and, in spite of our antitoxin treatment, their results are far superior to ours in the treatment of diphtheria and the sequelæ are very much less. I think that the method is an important one to bear in mind and one which can be carried out without difficulty. I am not opposed to antitoxin treatment, but think that it is well to apply the sulphur while waiting for the bacteriologic report.

DR. WILLIAM CUTHBERTSON, Chicago: The remarks of Dr. Keyes about the size of the dose of antitoxin are quite correct. We should have better results if we started with larger doses. In regard to the efficacy of sulphur mentioned by Dr. Gallant, I should feel much safer from the use of the antitoxin, although there is no harm in making topical applications of sulphur. It is well to start the antitoxin first and wait for the report of the culture afterward. We should make much more careful distinctions in the diagnosis of these cases than we have in the past, and by remembering that we would have much better results in puerperal infection. I have just had a case at St. Luke's Hospital in which there was a mixed infection, that of the streptococcus and the staphylococcus, and I summoned up nerve enough after receiving the bacteriologic report to treat the patient exclusively by means of the polyvalent serum of Marmorek. The patient entirely recovered through the use of the serum. If we will differentiate and use the serum that the bacteriologic report indicates, our mortality among puerperal women will be less in the future than it has been in the past.

GENITAL TUBERCULOSIS.*

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I wish to thank you for the invitation to address this section and assure you that I appreciate the honor.

Permit me to draw your attention to a group of diseases, which, I believe, has not received the attention it deserves, viz., tuberculosis of the genital organs. In fact, only twenty years ago the well known pioneer of gynecology, Hegar, of Freiburg, published his monograph on this particular form of genital disorders. At the meeting of the International Congress of Obstetricians and Gynecologists at Rome in 1902 it was proposed for discussion. Reviewing the literature we must confess however, that an astonishingly small number of observers have paid thorough attention to tuberculosis of the genital organs, including the peritoneum. This is all the more astonishing, as we know more about the tubercle bacillus than any other. From clinical observations we are not allowed to decide the possibility of its immigration by means of sexual intercourse. On the basis of experimental research by inoculation von Baum-

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