of pain, and a single large stone was found in the feces. These attacks have been repeated each year, and although they have varied somewhat in severity, yet the general symptomatology has been almost identical. Generally speaking, these attacks are becoming more severe and are lasting longer, ten weeks having elapsed at the time of making the report since the ushering in of the present attack. No gall-stones were observed by the patient since the initial attack, although in following back her history the patient tells of noticing in the last attack about "two dozen small brown objects the size of shot" in the feces; these were irregular in outline.

During these six years this patient had six pregnancies, the children all living and reported as being fairly well nourished but not rugged; in each instance the supply of mother's milk became insufficient at four or five months.

I have tabulated this history as follows: First child born Dec. 14, 1905; first attack, May, 1906. Second child born Dec. 16, 1906; second attack, May, 1907. Third child born Dec. 7, 1907; third attack, May, 1908. Fourth child born Nov. 22, 1908; fourth attack, March or April, 1909. Fifth child born Dec. 29, 1909; fifth attack, March or April, 1910. Sixth child born Jan. 11, 1911; sixth attack, March or May 14, 1911.

In the first, second and third attacks the patient was in the second and third months of pregnancy; in the fourth attack in the first month; in the fifth attack probably in the first few days of pregnancy. In each of these six pregnancies there was intense pruritus, which at times became almost unbearable.

CONCLUSIONS

From a study of this subject in general and from the special study of the cases submitted, the following conclusions may be drawn:

There is a close relation existing between cholecystitis and cholelithiasis and pregnancy.

Physiologic pregnancy furnishes sufficient predisposing cause for the production of these hepatic lesions in its disordered metabolism pending adjustment, changes in elimination of waste products, changes in the rate of elimination, mechanical pressure and in its psychic features.

Pathologic pregnancy, in addition to these factors, furnishes the pathogenic agent direct.

So-called physiologic jaundice in the new-born is an expression of the effort on the part of the liver to adjust itself to its new requirement, and should always be looked on as a serious condition; and when jaundice occurs in the new-born child, following jaundice in the mother, it is reasonable to conclude that this toxic condition was transmitted from the mother to the child *in utero*.

In all probability, much of the "dyspepsia of pregnancy" is from unrecognized hepatic lesions, and preferably those under discussion; at any rate, gastric disturbances in pregnancy, whether designated "morning sickness," "water-brash," "sour stomach," "nausea," or however they may be termed, should always be looked into further than the digestive tract itself and should not be regarded simply as concomitant features of a physiologic pregnancy.

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ABSTRACT OF DISCUSSION

DR. PALMER FINDLEY, Omaha: I should like to ask Dr. Branson to explain why there are so commonly attacks of cholelithiasis in the early months of pregnancy and not in the later stages, and then again, why these attacks often recur in the early puerperium?

DR. L. H. BRANSON, Iowa City: I should say that in the early months of pregnancy there is this process of adjustment going on. The system in the later months is already in working order.

RUPTURED PUS-TUBE, A CAUSE OF DIFFUSE SEPTIC PERITONITIS

WITH REPORT OF TWO CASES

A. P. STONER, M.D.

DESS MOINES, IA.

Spontaneous rupture of a pus-tube is a rare occurrence, and rupture followed by diffuse septic infection of the peritoneum is still less common. A small quantity of pus frequently escapes through the partially closed fimbriated extremity of an infected tube and may give rise suddenly to renewed pain, with rise of temperature, acceleration of the pulse, etc., but the inflammation remains localized within the pelvis, and the leak is promptly plastered over and securely sealed up with parts of the omentum, bowels, or some of the pelvic viscera. A few days of rest completes the repair process. When, however, a large quantity of infective material suddenly escapes from a distended tube, either through rupture of the wall of the sac proper, or, by the unfolding of the agglutinated fimbriated extremity of the tube, the peritoneum may be entirely unable to cope with it.

In an extensive research of the literature, Bonney¹ found but thirty-one authentic cases of diffuse peritonitis following rupture of a pyosalpinx, recorded up to 1909. Only fourteen, out of forty leading surgeons to whom he wrote concerning their experience with such cases, had ever seen the condition, and but nine of them had had cases of their own. Bonney had one case, which added to thirteen new cases which he collected, brought the number of reported cases up to forty-five in 1909.

Bovee² added eleven more cases, including one of his own. Lamouroux³ has published data of seventy-seven cases, besides one of his own. In a majority of the cases reported, no assignable causes have been mentioned. In a few cases the following exciting causes have been given: (1) straining, (2) lifting, (3) traumatism inflicted during coitus, (4) the use of strong purgatives. In Bovee's case, the attack came on early in the morning during sexual intercourse. The patient experienced a sudden and severe pain at the time. She was first seen by Bovee three days afterward, and was operated on the following day. He reports the right Fallopian tube ruptured. She died fifty-four hours after operation: about seven days after the accident. C. M. Echols⁴ reports two cases. In one, the rupture was caused by coitus. The patient experienced a sharp pain in the pelvic region immediately, and became nauseated. The other case was caused by an attempt of the patient to save herself from a fall. Both patients had Neisser infection, and both recovered after the removal of the ruptured tubes and securing of free drainage.

I wish to report two cases of diffuse septic peritonitis, following the sudden evacuation of pus from a pyosalpinx into the free abdominal cavity, which have occurred in my service, the histories of which follow:

CASE 1.—Miss T., a very intelligent and prepossessing traveling saleswoman, was seen by me about 2 p. m., June 5, at her hotel in this city. She complained of a very severe pain in the lower abdomen, which she said had come on very suddenly during the morning; no exciting cause being obtainable. Vaginal examination showed the uterus to be slightly enlarged and freely movable; cervix somewhat softened, tenderness throughout the pelvic region, more especially in the right side, but no mass could be outlined. There was a blood-tinged mucopurulent discharge from the uterus, and pus was easily

1. Bonney: Surg., Gynec. and Obst., November, 1909.
2. Bovee: Surg., Gynec. and Obst., April, 1910.
3. Lamouroux: Arch. gén. de chir., January, 1910, iv, No. 1.
4. Echols, C. M.: Surg., Gynec. and Obst., December, 1910.

expressed from the urethra. The patient grew rapidly worse, and was sent to the hospital at 8 p. m. of the same day. The temperature had risen from 99.5 F., at my first visit, to 102 F., when she was registered at the hospital. The pulse at this time was 120, and the vaginal discharge was distinctly bloody. Smears from the vaginal and urethral discharges showed gonococci in abundance. The patient's suffering was now so great that I was obliged to order morphin and atropin to allay the pain. She was more or less restless but slept at intervals during the night. The following morning she was resting better, but the temperature remained the same, and the pulse was 110. A blood-count at this time showed 18,000 leukocytes. During the night she passed a small clot of blood and particles of membrane which resembled decidua. She stoutly denied, however, any irregularity of the menses—the period was not due at this time—or any knowledge of pregnancy whatsoever. The cervix was much softened, and the evidence of pregnancy was so great that I decided to explore the uterine cavity for the removal of the product of conception if any were found. Accordingly, I had the patient etherized and explored the uterus with a sharp curet, but found it quite empty. She was returned to her bed at 2 o'clock and placed in the half-sitting posture. The following morning she consented to have the abdomen opened. The temperature was 103.6 F., pulse 120, and the expression indicated an extreme condition. A soap-suds enema was administered at 7 a. m., and at 8 a. m. the abdomen was opened, Drs. Minassian and Galloway assisting. When the peritoneum was opened, a thin flocculent pus welled up into the wound; it was found to permeate freely between the intestinal folds throughout the abdomen. Everywhere the intestines were injected and roughened; here and there they were plastered over with yellowish plaques of fibrinous deposits. Owing to the tension within the intestine, it was with some difficulty that the folds were packed off and a complete view of the pelvic adnexa obtained. The appendix was brought up and found to be normal. The right tube was next inspected, and at first sight appeared to be only slightly enlarged and thickened. A closer examination, however, revealed pus exuding from its distal extremity. The fimbria being deeply injected and partially folded on itself. The aperture into the tube readily admitted the little finger. The tube itself was flabby and contained about one-half dram of pus, which was easily expressed through the opening. Only a few recent adhesions were encountered. The left tube was apparently normal, as were both ovaries. The right one showed a recently ruptured Graafian follicle. The diseased tube was tied off close to the uterus and removed, and a large rubber drainage tube surrounded with a cigarette drain was secured with fine gut near the stump and brought out at the lower end of the incision and the wound closed. Much of the pus was wiped up with gauze sponges, but no irrigation was used. The operation consumed but a few minutes, and the patient was put to bed in a good condition and immediately surrounded with hot bottles. Proctoclysis was begun immediately and the Fowler position maintained as before the operation. The patient made an uninterrupted recovery and was dismissed from the hospital July 21, two weeks after operation. She left for her home in an adjoining state six days afterward. Examination of the pus from the abdomen showed the same specific infection as that obtained from the pus in the discharges from the urethra and uterus. The Fallopian tube evidently had become infected from pus in the uterine cavity. The fimbriated extremity, being the point of least resistance, gave way as the tube filled with pus. This doubtless occasioned the first sharp pains complained of prior to my first visit. The tube having been opened, doubtless there was more or less pus stripped out at each pelvic examination.

CASE 2.—Miss I., an accountant, aged 23, was seen by me in consultation about 4 p. m., October 6, about two hours after the onset of the attack. The patient had just returned from lunch and was at her desk, when without warning she was struck with the most excruciating pain in the pelvic region. A hack was called and she was taken to her home. I found her lying on a couch, in great agony from pain in the lower abdomen. There was a cold, clammy sweat, pulse 120, temperature 99 + F. An hypodermic injection of morphin and

atropin was administered at once. The following history was obtained from the family physician, who is a skilled practitioner. The patient had contracted gonorrhea six months before; the uterus and tubes had become involved early in the process. Several attacks of localized pelvic peritonitis during this period had been experienced, and she had been confined to her home most of the time, having only recently taken the position she was filling at the time of her attack. She had, however, refused any operative measures. On examination, I found the abdominal muscles fixed and rigid, and there was extreme tenderness all over the abdomen. The uterus was larger than normal and fixed in the pelvis. Any attempt to move it created pain. To the right and behind the cervix a boggy mass about the size of a lemon could be felt. I made a diagnosis of ruptured pus-tube, and immediately advised her being sent to the hospital. The patient was propped up in the semi-sitting posture in the ambulance and taken to Mercy Hospital at once, and was placed in bed in the same position. She refused to submit to immediate operation, but consented on the following morning to have the abdomen opened. Accordingly, at 9 a. m., under ether anesthesia, assisted by Dr. J. M. Mendenhall, and in the presence of Drs. Minassian and Crowley, I opened the abdomen in the median line below the umbilicus, using no elevation of the pelvis during the operation. When the peritoneum was opened, a thin flaky pus welled up into the wound; this pus was found throughout the abdomen, freely bathing the intestinal coils. In the deeper pelvic pouches the pus was decidedly more creamy and thicker in consistency. The intestines, as in the previous case, were deeply injected, and patches of plastic fibrinous exudate were frequently noted. The omentum was adherent to the fundus of the uterus, bladder and broad ligament. The adhesions having been detached, a large tubo-ovarian abscess of the right side was brought into view. It showed a large gaping rent in its wall through which pus was easily expressed. The abscess was so fragile that it was torn into pieces in effecting its removal. The left tube was much enlarged, filled with pus, and bound down in a mass of adhesions. The left ovary was cystic and was removed with the tube. The appendix was not observed during the operation. Time of operation, twenty-five minutes. A smear of the pus from the abdomen showed the gonococcus. The wound was closed around two large rubber drainage tubes, the ends of which reached into the respective pockets left by the removal of the pus sacs. The patient was returned to her room in good condition, the head of the bed being raised by placing the legs on dining chairs. Hot-water bottles and proctoclysis were ordered immediately. The convalescence was somewhat stormy; the pain was excruciating and required the use of morphin to control it. Catharsis was attempted early, and the bowels were moved by enema on the second day. The drainage tubes were removed on the fourth day. The temperature ranged between 99 and 102 F. until the seventh day, when it advanced to 103 F., and there was renewed pain in the right side. Vaginal examination revealed an accumulation to the right of the cervix. Under ether anesthesia a vaginal incision was made, and a large quantity of pus evacuated. Iodoform gauze was packed into the cavity; it being renewed daily until the discharge was reduced to a minimum. The patient now began to improve rapidly, and was discharged from the hospital October 26, nineteen days after operation.

I regret that cultures were not made of the pus from the abdomen in these cases. It leaves one to conjecture whether other pathogenic germs did not play a part in the infection. At the time the cases were under observation, I was not aware that cases of diffuse peritonitis from such a source were so rare; therefore, the importance of a full examination did not occur to me. It is well known that the soil furnished by the peritoneum is inimical to the growth of the gonococcus. Many observers believe infection of the general peritoneum, from the gonococcus alone, to be impossible. Gonococci thrive and multiply almost exclusively on membranes which are covered with cylindrical epithelium, namely,

the urethra, endometrium, the lining of the Fallopian tubes, Bartholin's glands and conjunctiva, their active life even here being comparatively short. Gonorrhea usually runs its course in a few weeks' time, regardless of the kind of treatment given. Purulent accumulations become sterile, active discharges cease, and whatever line of treatment may have been pursued in a given case is given credit for the cure which the system's defensive products have accomplished. Exceptionally, however, cases are observed in which the organisms maintain a pronounced virulency when cultured on a new soil, after months or even years of dormant life. From the character of the adhesions in Case 2, the process must have been of long standing. The pus in both tubes appeared to be old, being without appreciable odor. Case 1 was evidently a recent infection, as was shown by the adnexa being normal in contour, but slightly enlarged and thickened, and the adhesions being light and easily broken up.

From a clinical standpoint, no distinction should be made between leakage on account of incompetent closure of the fimbriated extremity of the tube and that of rupture of the wall proper of the tube. In each case, rupture comes from the constantly increasing pressure from within, which may be supplemented by other forces from without. As shown in my case, the symptoms in the former may appear more slowly, and be more difficult to interpret. The treatment of a case of ruptured pyosalpinx is the same as that for acute diffuse septic peritonitis from any other source. It may be concisely summed up as follows:

1. Put patients with suspected cases in the semi-sitting posture at once, keeping them in such position until operation. This will tend to limit the infection to the pelvic region, where absorption of the septic products is the least active.
2. Open the abdomen as early as possible; wipe up with gauze pads the accumulation of pus within the abdomen.
3. Find and completely remove the abscess.
4. Secure free drainage.
5. Maintain the Fowler position and start proctoclysis at once.

Therapeutics

ANESTHESIA AND ANESTHETICS

(Continued from page 1677)

CAUSE OF DEATH IN ETHERIZATION

There has been extensive discussion in regard to the occasional deaths which occur during anesthetization. It was formerly taught that death occurred during etherization from paralysis of the respiration; during the administration of chloroform from paralysis of the heart. Later observations and studies seem to show that the cause of death during the administration of ether may be due to paralysis of the heart as well as to paralysis of the respiration, and that in deaths from chloroform the respiration may cease before the heart fails.

It has seemed that a not infrequent cause of these deaths is a condition which has been designated as "status lymphaticus." In this condition there exists an enlargement of the various glandular structures of the body, and often a persistence of the thymus gland. This condition of enlargement of the thymus gland is associated with enlargement of the spleen, enlargement of the glands of the neck as well as of those of the abdomen,

enlargement of the follicles at the base of the tongue and in the pharynx, hypertrophied tonsils and adenoids. These various enlargements are often accompanied by a dilated heart and by extreme flaccidity of the heart muscle. In some cases the heart has been found small and the aorta contracted. Other less constant features which may be present are great pallor of the skin, enlargement of the tongue and sometimes enlargement of the thyroid gland.

Among the conditions sometimes associated with status lymphaticus are infantilism, exophthalmic goiter, epilepsy and rickets.

When death occurs associated with this condition there is usually a sudden failure of the heart and respiration, often before anesthesia is complete and often when the anesthesia is not deep.

Prof. Yandell Henderson ("Primary Heart Failure in Normal Subjects Under Ether," *Surg., Gynec. and Obst.*, August, 1911, p. 161) recalls that the deaths under anesthesia have been usually attributed either to unrecognized heart disease and hypersusceptibility to anesthesia, or to status lymphaticus. He believes that this explanation of these deaths is incorrect and misleading. He attributes them to the condition of so-called "acapnia." He illustrates this condition by saying that "anyone can do the crucial experiment demonstrating this at any time. Force yourself to breathe much more deeply and a little more rapidly than usual for a few seconds or minutes; and when you cease forcing your respiration you will, for a time, stop breathing altogether, or else breathe only occasionally or in a very shallow manner." This phenomenon he explains by saying that it is due to the absence in the blood of carbon dioxide which has been removed from the blood by the rapid breathing, and which is generally recognized by physiologists as being the normal stimulus to the respiratory center. This condition of diminished carbon dioxide in the blood is called "acapnia." He believes that deaths are far more likely to occur during the anesthesia when the patient has struggled violently against it, or when preceding the anesthesia, either on account of nervousness and apprehension, or on account of pain, the patient has breathed more deeply than usual, thus diminishing the amount of carbon dioxide in the blood and producing acapnia.

Anesthetics affect very positively the susceptibility to stimulation of the various organs, especially those of respiration and circulation. During light or intermittent ether anesthesia the susceptibility of the respiratory center to stimulation by carbon dioxide is increased; during full anesthesia it is about normal; but during deep anesthesia the susceptibility to such stimulation is diminished. If, therefore, during the commencement of anesthesia the patient struggles, consequently breathing more deeply, the carbon dioxide in the blood is diminished, so that when deep anesthesia is produced there is likely to be a quick paralysis of the respiration, or of the circulation. The same thing occurs if the patient is allowed to come partially out of the influence of the anesthetic.

It is impossible to predict, in these cases, whether the respiration or the circulation will be the first to suffer. For in some cases one, and in some cases the other, will feel the effect of the large dose of the anesthetic.

It has been generally believed that the presence of the so-called status lymphaticus was the cause of the rather unusually large proportion of cases of death during anesthetization which occurred in the course of operations for the removal of tonsils and adenoids.