8:45. Pulse 72, small, compressible, thread-like; respiration 12, laborious; feels chilly, has rigors, cold, clammy sweat over the body, stupor.

9:15. Vomits freely, has profuse perspiration, drinks and retains port wine, beef tea and coffee.

9:40. Emesis; nux vomica, coffee.

10:00. Emesis; cocaine $\frac{1}{2}$ gr., by mouth.

10:10. Feels easy; respiration 12, regular; pulse 106. Discontinued battery, which had been used uninterruptedly.

11:00. Emesis after 3i beef tea and a cup of hot coffee. Brandy hypodermically, which patient feels, being first return of sensibility; skin becomes warmer, pulse stronger; perspires profusely; feels sleepy, sleeps and rests well.

1:00 A.M. Awakes, is very thirsty. P. 80, R. 17. Drinks cold water; sleeps.

2:30. Awakes, drinks cold water, has severe frontal headache and pain in region of cerebellum. Temperature 100.2°.

8:00. Feels well; has rested well for several hours; walks down stairs, urinates freely, returns and vomits without distress. Takes a dose of cocaine ($\frac{1}{50}$ gr.) and drinks some beef tea.

11:00. Has appetite; eats crackers and bologna, causing burning in stomach, which soon leaves him, after which he feels well.

REMARKS.—Emesis following so closely after taking the first emetic leads me to believe that the action of the aconite itself was the principal factor. Ten minutes after swallowing the aconite, it had affected the motor system sufficiently to seriously interfere with the patient's walking up stairs; he fell twice on the stairs, and could not rise again without assistance. When entering the office his knees gave away under him, bending forward. The sensory system was paralyzed to such an extent that he could feel neither the hypodermic needle nor the injection. The aconite was taken by mistake for whiskey, with the intention to relieve colic—and it effected a cure. Patient says that the time during which he had lost consciousness seemed like a dream to him. He suffered an undescrivable agony almost instantly after swallowing the poison, which was relieved as readily by vomiting. His own story was that he would as soon die as to suffer again the agony he did before vomiting. How he got across the street to my office he does not know. The injection of brandy at 11 P.M. produced pain, the first return of sensibility; from that time I considered patient out of danger, though I watched him closely all night. On the next day the palate and throat were congested; this readily yielded to a gargle of iron and chloride of potash. On the evening of the 15th the patient was taken home in a sleigh, twelve miles, feeling well. When I saw him a few days after he told me that he never felt better in his life.

Patient took: Hypodermically, $\frac{1}{2}$ gr. morphia, 6 drops ext. fl. digital., $\frac{1}{10}$ gr. strychnia, f. 3j brandy; *per os*, 2 gallons warm water, 11 pints coffee, 3 pints whiskey; 20 drops ext. fl. digital., $\frac{1}{2}$ drachm ext. fl. nux vom., $\frac{1}{2}$ pint port wine.

THE OPERATIVE TREATMENT OF RETROPERITONEAL CYSTS IN CONNECTION WITH MICULICZ'S METHOD OF DRAINAGE.

Remarks before the Chicago Gynecological Society, March 18, 1887.

BY CHRISTIAN FENGER, M.D.,

OF CHICAGO, ILL.

It is not my intention to give an exhaustive review of the entire subject of retroperitoneal or parovarian cysts, but I merely wish to call attention to the subject for discussion, giving some of my own experiences, with a view of bringing out those of other Fellows of the Society. The subject is that of so-called parovarian cysts, or cysts of the broad ligament, or cysts with fimbriated epithelium, and I wish to call attention to a few facts concerning them before showing specimens.

We know that these cysts are said, in a great majority of cases, to develop from the parovarium, the rudimentary sexual remnant of the Wolffian bodies; more rarely, they are said to develop from the epoöphoron; finally, it is possible that cysts of the broad ligament may originate from hæmatomas. The canals of the parovarium being lined with fimbriated epithelium, may account for the fact that the inside of a number of these cysts is found to be lined with this form of epithelium.

Parovarian cysts are typically mono-cysts. In this respect they differ materially from proliferating cystomas or other ovarian cysts developed in or into the broad ligament. Both classes are retroperitoneal cysts, inasmuch as they are situated behind the peritoneum of the posterior wall of the abdomen, but the cysts of ovarian origin are more likely to have only a partial retroperitoneal or intra-ligamentous development; that is, part of the tumor within, part outside of the broad ligament; whilst the parovarian cysts proper are more likely to be completely surrounded by the broad ligament. From the broad ligament, and separating its two layers, they commonly develop inward to the sides of the uterus and downward toward the bottom of the small pelvis.

They are usually thin-walled, lined with fimbriated epithelium or mixed fimbriated and common cylindrical epithelium; consequently their interior surface is smooth, and they contain a thin, colorless, clear fluid of low specific gravity, with no formed elements. Between the peritoneal covering and the cyst wall there is usually a layer of loose connective tissue with but few vessels; which explains the facility with which these cysts may sometimes be separated from the broad ligament covering them, and enucleated without the use of cutting instruments, and with very little harm.

A typical cyst of this kind should have the Fallopian tube on its outside stretched out and flattened, because the cyst develops into the little mesentery of the tube. In the same way the ovary is found stretched out and flattened on the outside of the cyst near the tube. Exceptions to these common anatomical characters, however, are found. The cyst-wall may be thick, may become the seat of secondary growths, such as papillæ or papillomatous

fimbriated tumors, which, having developed on the inside of the cyst, may perforate the cyst-wall, protrude on the outside, and take upon them a malignant or semi-malignant character, invade the general peritoneal cavity, giving rise to multiple metastatic papillomas.

In cases of this kind, the contents of the cyst is not a thin, clear, serous fluid, but resembles more or less the fluid of the ovarian cystomas, with numerous formed elements, viscid character, and hæmative or blood mixed with it. The connective tissue layer between the cyst and the broad ligament may not be loose and deficient in vessels, but is sometimes so tense as to make separation of the cyst here almost or entirely impossible, and it may contain numerous large vessels.

As to the symptoms: The cysts usually grow slowly, and do not cause any inconvenience unless they reach a very considerable size. They are usually not very tense. The fluctuation is very distinct and superficial. When such a mono-cyst is large, the abdomen is likely to be flat, when the patient is recumbent, as in ascites, and the percussion note is apt to change somewhat with the position of the patient, thereby sometimes making the differential diagnosis still more difficult.

The parovarian cysts are likely to burst spontaneously, but the contained fluid is so little irritative in character that peritonitic symptoms rarely follow, the thin, clear fluid being absorbed quickly and readily. On this account, these are the cysts of the abdominal cavity which best permit of puncture or aspiration, as these trifling operations are not uncommonly followed by radical cures.

In this connection I will describe a case which came under my observation in 1884. A girl 18 years of age came to me from Racine, who had a cyst extending above the umbilicus, and about the size of a uterus in the seventh month of gestation. She had been accused by her relatives of being pregnant, but knowing this was not the case, came on here. On examination I found the uterus of normal size on one side of the cyst, and in my office, with a common hypodermic syringe, I drew off and took away for examination a perfectly clear fluid, and told the patient to come down for operation. She went home to make her arrangements, and came down a month later. The cyst had entirely disappeared, without symptoms of peritonitis.

In a case like this there may, of course, be a doubt as to the correctness of the diagnosis of a parovarian cyst; but it is reasonably certain that this was the case, as one of the characteristics of this class of cysts is that rupture into the peritoneal cavity causes no peritonitis, and the fluid is absorbed without difficulty.

The method of operating on these cysts we owe to Dr. Miner, of Buffalo, N. Y., who published in 1869 his operation by enucleation.

The surface of the tumor, or, rather, the broad ligament, when exposed after the opening of the abdominal cavity, is incised down to the wall of the cyst. In the loose connective tissue layer the broad ligament is now separated from the cyst wall. By

means of the finger or blunt instruments this separation can be continued, without the use of any force and without appreciable hæmorrhage, until the cyst is completely enucleated, and may be lifted out of the cavity. Evacuation of the cyst fluid after partial denudation of the wall, as a matter of course, facilitates enucleation.

In some cases of parovarian cysts, the development is to such an extent peripheral in the broad ligament that the uterine half of the latter is long enough for the formation of a pedicle. In such cases the usual operation for ovarian cysts may be performed at a sacrifice of the covering broad ligament, with tube and ovary. But such a peripheral development is not the rule, and whenever the cyst is developed down upon the uterus or into Douglas' fossa, or farther away still in the retroperitoneal space, enucleation is the only method available for its complete removal.

Difficulties during the course of enucleation arise when the connective tissue is tense and rich in vessels, necessitating dissection with the knife, and numerous ligatures. Further, if a large cyst develops deep down in Douglas' fossa, or even behind the rectum, or up into the mesenteries of the intestines, sigmoid flexure, or descending colon on the left side, or cæcum or ascending colon on the right side, we may find, in such cases, smaller or larger portions of these intestines spread over the surface of the cyst longitudinally and transversely, just the same as the Fallopian tube. It may be difficult, almost impossible, to remove the cyst wall from the intestines in such cases, and danger may arise from the fact that the intestines will not bear denudation of the muscular layers to any extent, as it easily becomes gangrenous.

The first case I met with was that of a married woman, 22 years of age, from Racine, who had a cyst which had been developing for two years. It was as large as a gravid uterus at term and contained a clear fluid. When the abdomen had been opened and the covering broad ligament had been incised down to the cyst-wall, I commenced dissection with a view to enucleation, but after working about half an hour dissecting and ligating vessels, I had advanced but very little. All that I could get out of the cyst was a piece as large as the palm of the hand. Consequently I was obliged to leave the cyst, after having united the opening into it with the abdominal wound and made use of a method of drainage of which I had intended to speak this evening, the so-called Miculicz drainage. The patient made a good recovery.

About a year ago Miculicz, of Cracow, proposed the following method of drainage, not only for retroperitoneal cysts, which can be excluded from the general peritoneal cavity, by uniting them to the abdominal wound, but also for drainage in the peritoneal cavity itself. He takes a small piece of iodoform gauze, stitches a silk thread to the centre of it, and folds it up in the form of a pouch, the silk thread being inside, that the pouch may be drawn up from the bottom by it. The pouch is now pushed down to the bottom of the cavity, and if nooks and corners

exist, it is pushed out so as to completely fill them. In the inside of the pouch is packed with iodoform gauze, as much as is necessary to completely fill up these spaces. This is the advantage claimed by Miculicz for his method of drainage as compared with the use of glass or rubber drainage. Besides the disinfectant properties of the iodoform gauze applied to the entire wall of such a cyst, Miculicz states as one of the advantages of his method that, by the capillary attraction of the gauze, everything is brought out—fluids which a glass or rubber drain could not bring out. We must remember that when we drain the peritoneal cavity with a glass drain down between the intestines or in the cavity of the cyst, we cannot always expect to get surrounding organs in so close contact with the drain as to drive the fluid out.

Further, there is this to consider: that a glass drain put down in the free peritoneal cavity has no tendency to bring out the fluid accumulated at the bottom; the intestines, filled with air, will simply swim in the fluid, and there is no pressure from without that will bring this fluid out of the glass drain, while the capillarity of the gauze is likely to help in that direction. I have had this remain in all these cases for about two weeks. As soon as the discharge ceases I commence first to pull out the loose gauze inside the sac. If a space is left after this has been pulled out I press in at that dressing a little more gauze. This is gradually removed, and the pouch itself is then pulled out by the thread gradually and finally. In all my cases it came out about the end of the second week.

The second case was similar to the first, inasmuch as there was no possibility, at least as far as my ability went, of getting the cyst out. It was a large cyst of eight years' development, in a woman fifty years of age, from Sioux City, Iowa. A prolapse of the uterus had developed during this time, and I was able to get out of the cyst, after considerable dissection, hardly more than two square inches. I used the Miculicz drain with the same result as before. The patient was operated upon October 31, 1886.

In the two above-mentioned cases enucleation was impossible, and we, with Ohlshausen, may have to class them under unfinished operations, as far as the extirpation of the cyst is concerned. But in cysts of the broad ligament, such an unfinished operation is, as a rule, followed by undisturbed and perfect recovery, and so I feel inclined rather to classify the above-named method of operating as a legitimate one for non-enucleable parovarian cysts, than to use the somewhat misleading and sinister term of incomplete operation.

The third case was a woman 50 years of age, in whom the cyst had taken three years to develop. The operation was performed February 2, 1887. The outside of the cyst looked smooth in this case because the connective tissue was so loose. It was the easiest thing imaginable to enucleate it from the retroperitoneal cavity in which it was developed. There were not two vessels to tie, and this accounts for the smoothness of the outer surface. This cyst was a typically normal one of that class, as it was covered all over with the broad ligament. The fluid

was perfectly clear; no remnant of a blood clot was present.

Now, when the cyst has been enucleated, the question arises; what to do? I was afraid to leave this large retroperitoneal wound without drainage, so I used Miculicz's method, and the woman is well. It is, however, a debatable question, and in the future it is probable that in a case like this drainage will not be used. Authorities like Ohlshausen very strongly recommend, even for a cavity as large as that, not to drain at all—not even to unite the surface of the peritoneum so as to exclude the retroperitoneal wound from the general peritoneal cavity. He says that when there is no infection, no sepsis, during the operation, there will be no peritonitis, and no septicæmia afterward. He also states that he usually leaves the cavity alone after these enucleations, and that peritonitis seldom or never follows as a consequence of the operation, nor do pelvic abscesses form.

This is where the matter stands, and these are the points for discussion. I must say that I do not dare to rely so fully on entire asepsis during the operation as to leave drainage out. Undoubtedly the recovery of the patient is quicker and easier without than with drainage, as very often, in the latter case, a fistula remains which may keep open for months.

The fourth case was an old and rather anæmic patient, more than 50 years of age, but apparently 60. She was pale and emaciated, and had a large retroperitoneal cyst, located partly in the peritoneal and partly in the retroperitoneal cavity, or, in other words, of partly extra- and partly intra-ligamentous development. As a natural consequence, the enucleation was difficult, since the peritoneal cavity was at once entered. On the inside of the cyst were papillomatous masses such as are found in smaller growths, cystomas of the ovary. These, of course, always indicate malignancy. On the inside of this cyst the surface was rough, velvety from the diffuse papillomatous condition of the entire inner wall, and in some places grown out into a large papilloma, but in no place smooth.

The operation in this case was rendered more difficult, because the connective tissue surrounding the intra-ligamentous portion of the cyst was comparatively tense, and further, because it had grown up into the mesentery of the sigmoid flexure, so as to be covered by it. When the cyst was enucleated there was a portion of the sigmoid flexure that I was afraid of.

There is one other point beside the intestines which we should be careful to avoid in the extirpation of these retroperitoneal cysts; that is, the ureters. As soon as we get into the neighborhood of the large vessels in the posterior wall, we must look carefully out for the ureters and locate them by palpation, as when the ureter is adherent to the cyst it may be easily torn. Miculicz's drainage was used in this case as in the others. The first three or four days she had no untoward symptoms, but on the fourth or fifth day she commenced to vomit, and became somewhat delirious and sleepy, and died, the temperature not having exceeded 101° or 102° F. I

saw her the evening before she died, and expected, on account of the vomiting, to find peritonitis, but there were no local symptoms at all. Then I supposed it to be sepsis without peritonitis, but the autopsy showed the cause of death to be uræmia.

We found in both kidneys, from pressure of the tumor on the ureters in a state of dilatation, not exactly hydronephrosis, but dilatation and subsequent atrophy, to a sufficient degree in my opinion to account for uræmia; for we know that patients with so much degenerative disease of the kidneys of any kind as to almost reach the limit of secreting tissue, are apt to get uræmia after operation. Whether the operation or the anæsthetic is the cause, I cannot say; but it is a well known fact. After the opening of the abdominal cavity, Miculicz's drain was laid down right between the loops of intestine, and, of course, a local but aseptic peritonitis formed along the drain. You will notice on the specimen I now present the impression of the meshes of the tissue of the drain, but outside of this a perfectly clear and smooth peritoneum.

As I remarked before, the chief point for discussion is the drainage. Ohlshausen does not drain in any such cases. This may be thus explained: He says that in many cases of this kind it is impossible to finish the operation. If we accept his classification, two of my cases would be termed unfinished operations; but I am certain that with an unfinished operation and a Miculicz's drain, a radical cure may be effected just as well, perhaps, as if the cyst had been taken out. This, of course, would apply only to a thin-walled cyst of a malignant character.

MEDICAL PROGRESS.

RECENT RESEARCHES IN DIURETICS.—To what extent the Malpighian corpuscles and the renal tubules respectively take part in the secretion of urine, is not yet accurately known, although the researches of Heidenhain, Nussbaum, and others, have added much to our knowledge. It seems likely that an investigation into the mode of action of diuretics will throw great light on the question, because a diuretic drug may act either on the Malpighian corpuscles, increasing the flow of urinary water, or on the renal tubules, increasing the amount of urinary solids, or on both structures. The great difficulty, however, in experiments on the kidney in living animals, is that of estimating how much of the effect produced by a drug is due to changes in the circulation, or in the nervous system, which has an influence on the secretory activity of the kidney, as well as on the blood-vessels. Munk has, in his recent experiments, eliminated these factors by investigating the action of diuretic drugs on an excised kidney. The organ, after excision, was nourished under a pressure of 100 to 190 millimètres of mercury, by a stream of blood and salt solution through the renal artery. The drug was added to the liquid, and its effect noted by the amount and

quality of the urine, collected through a canula placed in the ureter. Before the addition of any drug, it was found that the amount of urine secreted in an hour varied from 4 to 24 cubic centimètres; that this was a true secretion, and not a simple diffusion, was shown by the fact that it contained a greater proportion of saline constituents than the circulating fluid. The addition of chloride of sodium, nitrate of sodium or potassium, caffeine, dextrose, cane-sugar, or glycerine to the circulating fluid, increased the secretion of urine three to fifteen times, the pressure remaining the same; while in the case of nitrate of potassium and of caffeine, there was an increased rapidity of flow of the circulating fluid. Diuresis of this nature and under such conditions could only result, according to Munk, from a stimulation of the secretory cells of the kidney by the drug, a conclusion which, as regards caffeine, had already been arrived at by von Schroeder. An interesting result obtained by Munk was the appearance of hippuric acid in the secretion from the kidney, when benzoate of sodium and glycol were added to the fluid circulating through the vessels of the kidney. As is well-known, benzoic acid given to any animal appears as hippuric acid in the urine; and this result has been supposed to be due to the action of the intact blood-corpuscles. But in Munk's experiment, these were absent; hence, he concludes that the transformation is probably brought about by the oxygen which is combined with the hæmoglobin.—*British Medical Journal*, Dec. 11, 1886.

ANTIFEBRIN.—MR. J. K. MURRAY reports the following cases as showing the advantage of antifebrin over other antipyretics:

Case 1.—J. B., aged 3; meningitis, with a temperature ranging from 102° to 105.4° F. Three-grain doses were at first tried in the forenoon. The temperature fell from 105° to 101.4° during the first two days, but on the third evening 100.4° was registered. Five grains were then given every three hours, and the temperature fell to 99.4° after two doses, and remained thereabouts. When two doses were omitted the temperature rose again.

Case 2.—A. V., aged 2; broncho-pneumonia, with temperature from 103° to 105° F. At first three-grain doses were given every three hours, and for four days this kept the temperature below 100°. On the fifth day the temperature rose repeatedly above 102°, so five grains were given every three hours, and the temperature fell to 99.4°, and remained at that point.

Case 3.—M. L., aged 25; pyelo-nephritis. Fifteen-grain doses were used. The temperature fell to 99° within one hour and a half, and remained there for ten or twelve hours. I had the temperature taken every three hours, and whenever 101° was registered, fifteen grains were given. Quinine in ten-grain doses was tried under the same conditions. The temperature fell about 2.4°, but rose 104°, and sometimes 104.8° within six or seven hours.

Antifebrin seems much more powerful than quinine, kairin, or antipyrin. It equals antipyrin in the duration of its effects, and in this respect surpasses