seeing the nature of the tumor and its contents, the operation need not be proceeded with. It might be treated thus far as an exploratory operation, the information gained from which would govern ulterior measures. Baker Brown operated after Bainbridge's method.

The late Professor Simpson thought the proceeding might be usefully modified by making a preliminary tapping, with the view of ascertaining the nature of the fluid; and if this were found to be benign, to allow it to escape into the peritoneum. In this way, he said, having made sure that the fluid was innocuous, he stopped the tapping by shutting up the cutaneous orifice, and allowed the last part of the fluid to run into the cavity of the abdomen. To provide for the escape of subsequent secretion into the abdomen, it is necessary to keep the lips of the puncture in the cyst from closing by first intention. This is the great difficulty. To gain this object, he sometimes made use of a large "quadrangular" trocar. He then forcibly compressed the tumor daily, so as to break down the adhesions which tended to close the cyst. In this way, at least one cure was effected.

These proceedings have not been justified by experience. Repeated simple tapping would seem preferable. It is better to get rid of the fluid directly, than to let it flow into the peritoneal cavity.

Electrolysis.—Does any resource still present itself before the *ultima ratio*, ovariotomy? Some hope has been raised by the method of electrolysis. Like iodic injections, electrolysis was first tried upon hydrocele of the tunica vaginalis. When a student in Paris I saw some cases treated not without success by Leroy d'Etiolles by electrolysis; and I have an indistinct recollection of his applying the same method to other tumors, including ovarian. Fieber reports (*Wien. Med. Presse*, 1871) an apparent cure. The case is further attested by Braun. Other promising illustrations are cited in America and Canada. A memoir on the subject, which I have not had the opportunity of seeing, was read at the session of 1877 of the American Gynæcological Society. In 1876, when on a visit to Montreal, Dr. Macdonald showed me a patient who, in his opinion, confirmed by another surgeon who had aided in the treatment, had been cured by electrolysis. I was not able to detect any remains of disease.

Of uncertain efficacy in hydrocele, electrolysis does not promise much for the more difficult cases of ovarian cystic disease. Treatment must in any case be tedious. In the colloid or proliferous cysts, which make up the greater number of ovarian tumors, it is hard to understand that any benefit can be obtained. And the simple cysts can be dealt with by quicker and surer methods. Still reports of instances in which electrolysis has been tried on cysts precisely diagnosed are interesting.

OVARIOTOMY OR EXTIRPATION OF THE DISEASED OVARY.

Ovariotomy has been contrasted with tapping. The fallacy that deprives this comparison of all practical application is of the same kind as that which invalidates all absolute doctrines in medicine. There are cases for which ovariotomy is best; there are cases for which tapping is best. The great distinction between the two operations is, that the first

kills or cures; whilst the second hardly ever cures, and can, at best, prolong life. Looking to cure, we should prefer ovariotomy, if the case admitted of this operation; looking to mere palliation, we must in many cases resort to tapping. The first is more an operation of choice, the second rather one of necessity.

It has been urged against tapping that it lessens the chance of ovariotomy being successful by promoting the formation of adhesions. This objection has been disposed of by experience. The moderate parietal adhesions following tapping rarely present any serious obstacle to the execution of ovariotomy. On the other hand, tapping is often useful in clearing up the diagnosis; as a means of gaining time for the patient's general health to recover; or of lessening the shock by removing the fluid a few hours or days before removing the solid portion of an ovarian cyst. Thus, it may be affirmed that tapping promotes the success of ovariotomy, instead of being antagonistic to it.

PRECAUTIONS BEFORE OPERATING.

1. It is needless to say that a *good diagnosis* is the first point.

2. If there is much *anasarca or œdema* of the legs, it is well to tap some days previously. Great prostration, with quickly supervening dyspnœa, carry the same indication. The effused fluid becomes absorbed and excreted, thus removing what might be an injurious complication. If this be not done, the absorption-process must go on simultaneously with the wished-for process of healing from the operation. In this case the quality of the blood is impaired by having thrown into it, just at the wrong time, a large quantity of watery and effete material.

3. Examine the *urine for albumen.* The presence of albumen is not indeed an absolute contra-indication, for it may depend upon temporary congestion of the kidneys, the immediate consequence of pressure by the tumor. The tumor removed, the kidneys may recover. But if the albumen be accompanied by casts, by persistent œdema of the legs, hands, and face, heart-disease complicating, and be thus traced to permanent Bright's disease, the operation will be likely to fail. Brodie used to insist upon this condition as being highly adverse to the success of capital operations.

Mr. Wells insists further that a small quantity of highly concentrated urine, depositing mixed urates in abundance, indicates a state of hepatic and renal disorder which should be corrected before operating. For this purpose saline purgatives, as sulphate of soda, carbonate of magnesia, and lithia-water may be given with advantage.

4. *Avoid*, unless the urgency is extreme, *a menstrual epoch.* When we can select, the best time is within a week after a period.

5. *The state of the heart and lungs* should also be examined as to their soundness and fitness for work. If there is advanced phthisis it may be of doubtful advantage to operate.

6. *The season.*—When there is a choice it is wise to follow Brodie's advice as to avoiding operation during an east wind. The wind is of more importance than the mere season of the year, the only point usually

noted in statistical tables. An east wind in June may bring more hazard to a severe operation than a west wind in March.

7. If there be evidence of *malignant disease* in the abdomen or elsewhere it will rarely be advisable to operate.

8. Ovariotomy should not be practised whilst the tumor is small, nor until the constitution has undergone some degree of impairment from pressure, and the other effects of the disease. It was at one time very naturally thought that a patient would have a better chance if the operation were performed whilst she was in robust health, and the tumor was small. But experience has not borne out this *a priori* reasoning. Wells prefers waiting. Keith says, "I prefer operating when the tumor is large, and when the patient has suffered a good deal." A better reason perhaps is that in long-standing cases the peritoneum has under constant friction by the tumor undergone such changes that it has lost much of its susceptibility to injurious reactions under exposure, and the other interferences incidental to the operation. Where adhesions are extensive, it may even be said that we are no longer dealing with a peritoneum in the strict sense.

9. If by tapping or other means we get distinct evidence that the tumor is *colloid*, the danger of waiting outweighs the advantages. Such cysts may grow rapidly, and are very apt to undergo perforation, bursting, inflammation, and suppuration. Unfavorable changes are very apt to follow tapping in these cases. Hence, whenever tapping shows colloid matter, or very little fluid of any kind, especially if the tumor presents irregular projections, it is well to be prepared to operate within a few days.

10. The *place* chosen for the operation is a matter of importance. It should be fairly spacious, light, well-ventilated, and the furniture should be limited to what is necessary. Carpets covering the entire floor are objectionable. A strip on either side of the bed, and a piece or two in places much used, to prevent noise, and which can be taken out of the house to clean, are all that is desirable.

11. The *nurse* should be especially qualified by training; be able to pass the catheter; keep utensils perfectly clean by disinfectants; and able to exercise efficient yet gentle control over the room. She should have nothing else to do. This is a matter of course in a private house; but it is still more imperative in a hospital. A nurse attending an ovariotomy patient should not come into contact with any other patient; above all, she should not be exposed to the risk of contact with infectious or surgical patients.

12. This touches closely upon the great question whether ovariotomy should be performed by surgeons in ordinary hospitals. It may be urged, as a general fact, that all serious surgical operations are exposed to an increased element of danger in large hospitals; but that this is not held to be an adequate reason for not performing them there. The circumstances of the patient may leave her little choice; whilst the practised skill of the hospital surgeons, and the excellence of the general arrangements of the hospital, may be thought to outweigh the attendant disadvantages. This much being admitted, it will be asked, Is there any special condition attached to ovariotomy, which makes this operation an exception to the general rule, which turns the scale the other way? I think there is. Ovariotomy in some respects has analogies with parturition. The sudden removal of an enormous growth feeding upon the system leads to a constitutional revulsion, and suddenly altered dynamic and constituent conditions of the circulation, which, as in a woman after labor, render her peculiarly susceptible to external impressions, and especially, to the deleterious action or morbific poisons. To this risk is added the exposure of the peritoneum, a structure remarkably obnoxious to toxical influences, and easily absorbing any contaminating matter which the operating surgeon or his assistants, who are constantly working, as Sidney Smith would say, in the midst of "pus and miasm," are so likely to contract. This danger may be materially lessened by careful adaptation of the antiseptic methods which have been so successfully applied by Lister in other departments of surgery.

With all possible precautions, however, I do not believe that ovariotomy in large general hospitals will ever give results that shall compare favorably with ovariotomy done in private houses or small special hospitals. In this country, at least, where the rights of the humbler classes are respected to a degree unknown elsewhere, it is practically admitted that to deliver women in lying-in hospitals or in general hospitals, is a proceeding justifiable only under peculiarly exceptional conditions. Recognizing this unreservedly, I have felt it my duty steadily to resist the extension of lying-in hospitals, notwithstanding the great temptations these institutions offer for scientific observation and teaching. The passion for study must be kept in subordination to the claims of humanity.

Instruments required.—The necessary instruments for a simple case are few. A scalpel and strong scissors, to divide the abdominal wall; a director, to protect the cyst as this division is completed; a trocar, to empty the cyst; a clamp, to secure the pedicle; needles and silk, to close the wound; with forceps and ligatures, to secure any bleeding vessels, complete the list. But there is no operation where the surgeon may be so met by difficulties where he least expected them. It is wise to take to every case a full armamentarium to meet every possible emergency. Clamps of different sizes, cautery clamps, and cauteries for cases where the clamp is not applicable; whip-cord and silk ligatures; needles of different shapes and sizes, for cases where neither clamp nor cautery effectually deals with the pedicle; large harelip pins, or acupressure needles, for cases where simple ligature cannot be trusted; clamps with screw fastenings, for temporarily securing separated omentum or torn vascular adhesions; artery forceps of different lengths, torsion forceps, bulldog forceps, vulsella specially adapted for holding large cysts; a chain and wire écraseur; glass drainage-tubes; and perchloride of iron should always accompany the operator. The thermo-cautery is convenient. A lamp and a small hand-mirror should also be provided.

Preliminary Preparations.—A saline purgative should be given the day before; and the bowel washed out by an enema on the morning of the operation. If the operation be fixed for the morning, and this is to be preferred, the patient will take only a light breakfast, at least an hour before.

A strong narrow table is placed conveniently for light and access. It is covered with a firm squab, over which is laid a blanket, and then over

all a waterproof sheet. Two or three pails are ready to receive the fluid and the tumor. A small table is placed within reach of the operator's right hand, so that he can help himself to the instruments laid out on it. Iron or copper cauterizing implements are kept in the fire. An assistant is charged with the thermo-cautery, and a strong solution of perchloride of iron. On the fire also is a kettle of water boiling. A nurse has charge of basins, cold water, several sponges, and pieces of thin flannel steeping in hot water, ready to wring out when wanted. All the water used should contain about one per cent. of carbolic acid. A special assistant is ready with the carbolic spray.

The room is kept well ventilated by a fire; but it is not found necessary to keep up a heat of 90° Fahrenheit, as it was at one time thought to be.

The patient is clothed in flannel drawers, stockings, and night-gown, it being important to prevent long exposure of a large surface of the body to cold. She is rendered insensible by chloroform, bichloride of methylene, or ether in her bed, and then removed to the operating-table. The legs are strapped to the table by a belt like a horse-girth. The hands should also be secured by straps. This avoids the necessity of supernumerary assistants. It may be laid down as an axiom, that every additional assistant brought into contact with the patient is an additional element of danger. A waterproof sheet, having a slit in the middle large enough to permit of the operation being done within it, is laid over the patient. This obviates all overflow and mess on the patient and the floor by conducting the fluid contents of the cyst into large pans or buckets placed under the table. An assistant stands at the operator's left hand; another opposite on the other side of the patient. The assistant in charge of the anæsthetic apparatus stands at the patient's head. The catheter is first passed, to insure an empty bladder. The assistant in charge of the antiseptic apparatus plays the spray so as to envelop the hands of the operator and assistants and the abdomen of the patient in an antiseptic mist.

In making the incision, the following structures are successively divided: 1. The skin; 2, the subcutaneous areolar tissue, with fat of varying thickness; 3, the interlaced fibres of the aponeuroses of the abdominal muscles constituting the linea alba; 4, layers of the fascia transversalis, with more or less fat (the uppermost layer adheres closely to the linea alba: the deepest layer is only very loosely connected with the peritoneum); 5, the peritoneum.

The peritoneum may be raised with a hook or forceps. The membrane is then divided by horizontal touches with the knife, and an opening made large enough to admit the insertion of a broad director. Upon this the peritoneum should be slit up.

It is desirable to keep the incision as short as possible. If the tumor will not come through the short incision first made, it can afterwards be lengthened. Any bleeding vessels in the abdominal wound may be secured *pro tempore* by hæmostatic forceps; and afterwards twisted, or tied with carbolized silk, if necessary.

The incision is made with a scalpel in the linea alba from below the umbilicus towards the pubes, three or four inches long at first, proceeding

very carefully as the peritoneum is approached, lest the cyst be penetrated, and its contents escape into the peritoneum before the wound is completed. The peritoneum may be protruded through the wound by some ascitic fluid behind it, and impose upon the operator for the cyst. The touch will commonly correct this by feeling the more solid cyst behind it. The peritoneum is then opened. The cyst comes into view. If ovarian, especially if simple, it is recognized by a glistening, pearly, smooth aspect. If it be a compound cyst its surface may be uneven, it may be redder, vascular, and even hard. If it be a fibroid or fibro-cystic tumor of the uterus the appearance is dark-red, fleshy, and firm. The incision is made just large enough at first to admit the hand, which should be passed in *clean*, and very gently, lest it rupture the cyst, and carried round between the abdominal wall and the cyst, to feel for adhesions, and if there be any to separate them. This is best done all over the front of the tumor, whilst the cyst is full and tense. The cyst is then punctured by a smart stab with a large trocar, to which a flexible tube is attached, to carry the fluid into a receptacle on the floor. The trocars of Mr. Clay and Dr. Lloyd Roberts are the best I am acquainted with. They hold the cyst-wall after puncture well, and without much risk of tearing away. As the cyst is collapsing its walls are seized in one or two places by forceps, so made as to hold a good fold of the cyst-wall without tearing it. Mr. Sydney Jones has contrived a good forceps for this purpose, and which is also useful as a temporary clamp for adhesions. Whilst an assistant supports the sides of the wound with flannels wrung out of warm water, with the double object of preventing the protrusion of intestines and the escape of fluid into the peritoneal cavity, the cyst is drained as far as it will flow freely. At the same time gentle traction is made on the cyst, to see if it will turn out of the abdomen. If this does not occur readily, the evacuation goes on, and the hand is passed in to explore all round the tumor, breaking down adhesions, if necessary, and ascertaining the existence and extent of solid portions, which may by their bulk oppose the removal of the tumor. If, during this proceeding, the cyst-wall be kept well drawn out, and over one side of the patient, the opening made by the trocar will be clear of the abdominal wound, and no fluid will escape into it. If there are no adhesions, or only such as are readily broken down, and if there is little or no solid element in the tumor, it will easily turn out. As this is done, the assistants, with warm moist flannels, carefully press up the abdominal wall behind the tumor, so as to keep the cavity closed. Care is taken, especially at the last stage, to prevent the tumor falling suddenly, lest it drag injuriously upon the pedicle. When it is fairly out, and well supported, the operator examines the pedicle.

The pedicle.—If the pedicle is of sufficient length to permit of the stump being secured outside the abdominal wound without dragging upon the uterus, this method should be preferred. This, the so-called *extra-peritoneal method* of dealing with the pedicle, stands in contrast with the intra-peritoneal method of tying or cauterizing the pedicle, and leaving it in the abdominal cavity, closing the wound over all. Mr. Hutchinson's introduction of the clamp to facilitate the extra-peritoneal plan has been very generally admitted to be one of the most substantial improvements

acquired for ovariotomy. The choice of a clamp is important. A good clamp unites the following points: it is sufficiently long and slightly curved on the flat, so as to embrace the pedicle well and allow the ends to rise up away from the wound and the abdominal wall; the ends are smooth and rounded, so as not to dig into the skin; the two blades are roughened on the inner sides, and made by a screw at each end to carry the blades together in perfect parallelism, thus safely strangling the vessels and crimping the stump; the screws are accessible and work easily, so as to permit of easy removal of the clamp when it has done its duty. The clamps which, to my knowledge, most completely answers to this description, are those of Drs. Chambers and Lloyd Roberts. Securing the stump outside the wound possesses the following advantage: The surface, which may bleed or yield noxious discharges, is always kept in sight, and all discharge escapes externally. It has been urged that the seclusion of the stump within the abdominal cavity places it in a like position to a subcutaneous wound, and that it is consequently less likely to undergo decomposition than if exposed to the air. The stump, it is affirmed, will be surrounded with benignant plastic effusions, and thus occasion no trouble. These propositions are to a great extent true. But experience proves that the method does not guard against danger so surely as that of keeping the stump outside. The ligature which is necessary to secure the pedicle must be very strong; it must be drawn very tightly to close the vessels in it; sometimes two or three stout ligatures are necessary. These themselves may be a source of irritation. Then, after a while, the tissues embraced in the ligatures shrink a little, the ligatures become looser, and under returning reaction bleeding takes place into the abdomen. Mr. Spencer Wells has also observed that on the return of menstruation, blood is poured out from the surface of the stump. Dr. Lloyd Roberts, who has carefully studied the relative merits of the two methods, is of opinion that menstruation is less likely to take place under the intra-peritoneal method; that under the clamp method the Fallopian tube is apt to maintain its patency, thus giving issue to menstrual secretion, and keeping up a troublesome sore. He, however, as a general rule prefers the clamp, and suggests that it is better suited to non-menstruating women. My own observation would lead me to conclude that tying or cautery is more especially applicable to women past the climacteric.

Other disadvantages of the clamp are: the length of time required for its separation and for the healing of the wound, owing to the ulceration produced by the pressure of the clamp. This last trouble may be lessened by the choice of a good clamp. Another danger attending the clamp is that the stump strangulated in it, may slough and fall back into the abdomen.

But the successful use of the extra-peritoneal method depends upon the pedicle being long enough to afford a good hold for the clamp, and for this to rest upon the abdominal wall *without serious strain or dragging* upon the broad ligament and uterus. This dragging is the source of great pain, and may lead to exhaustion or inflammation. If it is found to occur after the clamp has been applied, it may be wise to tie the stump below the clamp and let it drop into the cavity, either cutting the ligature close, or keeping the ends hanging out of the wound.

Ligature.—If the pedicle is too short for a clamp, it is seized by a long screw-forceps fenestrated; and below the fenestræ a strong whip-cord is carried double on a needle through the pedicle, and then tied in two parts. One end may be brought out of the wound, or both ends cut short and dropped in.

Cautery.—Where the pedicle is too short even for the ligature to give a secure hold, it should be grasped by a cautery-clamp, and the tumor severed from it by the actual cautery. Care should be taken to use a dull heat only, so as to char down very slowly. This method will probably come into more extensive use, as one of election and not alone of necessity. Keith tells me (November, 1877) that out of fifty-nine cases so treated by him only four died. The cases best fitted for cautery are those in which the pedicle is thick and fleshy.

Another method of securing the pedicle is the "*pocketing*," so-called by Dr. H. Storer. The pedicle held in a clamp, is divided by scissors, bleeding vessels are secured by wire ligatures, and then having united the primary incision by means of iron-wire sutures, he brings the extremity of the pedicle between the inner lips of the wound at its lower angle, and there "*pockets it.*"

One cause of mortality after ovariotomy is hemorrhage. It is the most preventable. No pains, no time can be misspent in securing against this accident. The bleeding may come from three sources: 1, the large vessels of the pedicle. This of course is obviated by care in setting the clamp, or by ligatures or cautery; 2, from vessels severed when separating the cyst from adhesions. These may be secured by carbolized silk ligatures cut short and left *in sitû*, by torsion, or by cautery; 3, from an inflamed or vascular surface oozing "*en nappe*" where no bleeding-vessel can be seen. This is a peculiarly dangerous form, for unless effectually arrested before closing the wound, it may go on afterwards and cause death. I have tried actual cautery, colloid styptic, and swabbing with perchloride of iron, and have no hesitation in saying that the iron is the only thing to be relied upon. The bleeding surface should be swabbed with a strong solution, lightly wiping off any superfluity. The application is, I believe, harmless; I have had uninterrupted recoveries after it; and it is surely less to be apprehended than hemorrhage.

To insure full visual inspection of the cavity of the pelvis or other hollows, it is well to be provided with a hand looking-glass or a lamp to throw light into dark nooks.

When the pedicle is secured, search for the other ovary, to ascertain if it be not so affected as to require removal. Also trace the omentum to see if all is clear from entanglement with the intestines. If a fibroid tumor project from the uterus, it is better to leave it alone.

Clean out the Abdominal Cavity.—Remove by sponges all ovarian fluid or blood which may have found its way in. This is an object of paramount importance, and especially so if the contents of the cyst be viscid or puriform. But too great pains cannot be taken to prevent fluid getting into the peritoneum. If it be found, from the cyst being rotten or other cause, that the fluid will run over, turn the patient on her side, so as to give a dependent drainage away from the abdominal cavity.

Drainage.—When closing the wound the question of *drainage* must be considered. A large proportion of deaths occurs from septicæmia, connected with the collection in the peritoneum of purulent matter or blood, or serum undergoing change. If this could be drawn off, it is reasonable to infer that the prospect of recovery would be improved. Experience confirms this inference. Keith especially commends the practice. It has been proposed to place in every case a drainage-tube through an opening expressly made in the bottom of Douglas's pouch into the vagina. Experience has not proved that this plan is judicious. In the first place, the simple cases, uncomplicated with hemorrhage, adhesions or foul matter in the peritoneum, commonly do so well without drainage that it is *primâ facie* unwise to introduce a possible element of danger. In such cases, then, drainage should be dispensed with. In cases where the adverse conditions are present drainage is of eminent service. In many cases a sort of natural drainage has been established by the side of the stump; and sometimes when this has not been considered sufficient, the surgeon has removed one or more sutures, so as to allow freer evacuation and syringing of the foul cavity. And this with good effect. But there is an advantage in making special provision for drainage. The following is the method of drainage adopted by Keith. I am indebted to him for the description. He uses a glass tube open at both ends, one end, and that which goes into the pelvis, being, moreover, perforated for an inch or so by several holes. The tube is selected of a length that may appear suitable. This is usually about six or seven inches. The calibre is chosen large or small just as oozing of blood or only serum is expected. On the neck of the tube is a raised shoulder or rim to hold a piece of thin sheet India-rubber 18 inches square, so as to wrap over a sponge wrung out of carbolic acid solution—1 in 30. This sucks up any fluid that may drain, preserves cleanliness, and enables us to know to a drop how much escapes. The tube is placed tightly between the two lower stitches, the end passing down into Douglas's pouch. Any fluid collecting in the pouch can be drawn off by passing a fine India-rubber tube down the drainage tube and aspirating by a syringe. This should be repeated twice a day, if necessary, and the sponge replaced. The glass tube, it is clear, acts like the shaft of a well, and the syringe converts it into a pump. The tube may also serve as a means of washing out the cavity, by injecting weak carbolic water. The drainage tube may generally be removed at the end of five or six days. But, adds Keith, "Since I have regularly done my ovariotomies under the carbolic acid spray, I drain almost never. If you leave sweet serum behind and a sweet abdomen, the peritoneum will take care of itself after oozing. Antiseptics will do away with the blood-poison."

J. F. Miner (*Buffalo Med. Surg. Journ.*, 1856) suggested a very well-designed plan of drainage. Having tied the pedicle as a whole, he carried the ends down through an opening made in *Douglas's pouch, thus inverting the part like a funnel* and securing a drain for any purulent matter that might form.

Closing the Abdominal Wound.—Every variety of suture has been employed. The choice has not much effect upon the result of the operation. Most operators use the silver-wire.

It has happened to me to have to use both silk and wire in the same operation. I found the wire sutures were more free from purulent tracts than the silk. They are also more convenient for removal. Wire, therefore, should be preferred. The sutures may be carried either by glovers' needles about two and a half inches long, each end of the suture being armed with a needle, or by a strong, slightly-curved needle mounted on a handle. The advantage of the first plan is that each needle may be introduced from within outwards, so as to attain more exact uniformity in adaptation. Each suture should take in about a quarter of an inch of peritoneum, and then perforating the whole thickness of the abdominal wall obliquely, come out about three-quarters of an inch from the wound. When the two heads of the suture are brought together, the two sides of the wound are thus accurately apposed. Sutures should be applied at intervals of an inch. They should not be secured until all have been introduced. An assistant holds all the heads in order as they are passed from above downwards, so as to avoid entangling. If the clamp has been used, a suture should be applied close to it, so as to bring the lips of the wound close together around the pedicle.

The clamp is then warded off from the skin and wound by a pledget of lint soaked in carbolized oil laid beneath it. The surface of the stump should be sprinkled with dry perchloride of iron, or with tincture of iodine.

The Dressing.—Pledgets of carbolized lint are laid on the wound. Over this is a layer of carbolized gauze. Pads of antiseptic cotton-wool are disposed on each side; broad strips of plaster are passed over all, so as to give firm support; and lastly, a flannel belt secures all. It is a great advantage to use a many-headed flannel bandage; the heads crossing each other in front can be adjusted with great accuracy, securing uniform pressure; and when it is necessary to examine the wound this can be done with the least possible disturbance, by simply throwing back the ends of the bandage.

Certain complications may render it expedient to modify the operation.

1. The *cyst* may be so *friable or rotten* that it breaks down under the most careful handling. Great pains must be taken to bring away the cyst without leaving pieces of it, or the contents in the abdomen.

2. If the *cyst is multilocular*, so that after tapping the main cyst the tumor is still too large to come through without enlarging the abdominal incision, the septa should be broken down by the hand, and any semi-solid contents brought away. It is only when accommodation cannot be got in this way that the incision should be extended.

3. *Extensive firm adhesions* may be found in front. These can generally be broken down by the flat hand working under the abdominal wall. But it may be necessary to enlarge the wound and evert its lips, so as to be able to divide the adhesions by the handle of the scalpel, by its edge, or by the adze-edged cauterizing iron. The latter is perhaps the best plan, as it stops bleeding. The bands of adhesion are first embraced by a clamp, such as of those proposed by John Clay and Chambers; the iron of a dull heat is then applied to the cyst-side of the clamp, which protects the visceral side from injury. If divided by knife it may be

necessary to tie small bleeding vessels with silk or wire. When this is done the ends of the sutures should be cut off short. If obstinate adhesions to the intestines are found the same means must be employed to divide them. It has been found occasionally necessary to leave portions of the cyst adhering. If there be adhesions to the omentum these must be carefully detached as far as possible. The omentum itself must then be spread out on a clean napkin, and examined for bleeding points. Wherever these are found a silk ligature is put round them, the piece of omentum is cut off, and the ligature cut short.

Mr. Hutchinson calls attention to *a special difficulty* caused by adhesions in front. Great difficulty may occur in distinguishing the cyst. The operator may mistake the cellular interspace between the transversalis fascia and the parietal peritoneum for that between the cyst and the latter. If not quickly discovered this error may be the cause of great damage. In endeavoring to avoid it the surgeon may commit another; he may incise the visceral peritoneum of the cyst, and proceed to separate it. In many cases the exterior of the cyst deprived of its peritoneum is smooth, white, and glistening, the adhesions are cellular and easily broken through, so that there is nothing to apprise the operator of his mistake. One plan there is in case of perplexity to avoid all risk of these two errors: it is to enlarge the wound upwards until the peritoneal cavity is opened at a part where no adhesions exist. When once the operator's finger has touched the intestine he knows where he is, and may proceed to detach adhesions without any fear of mistake.

In cases where the detachment of the cyst would be dangerous or impossible, Dr. Atlee has solved the problem by a very ingenious plan. He leaves the peritoneum with its adhesions, by separating it from the fibrous wall of the cyst, so that the adherent portion peeled off is left in contact with the viscus to which it was attached. "Dr. W. L. Atlee has practised this," says Peaslee, "for many years past. In his 215th case adhesions seven or eight inches long were thus left attached to the transverse colon." This is a form of *enucleation of the tumor*, a proceeding by which the whole or the greater part of the tumor is peeled out of its peritoneal investment. Dr. Miner claims the credit of designing this ingenious plan. Dr. Walter Burnham, of Lowell, Mass., reports a successful case. Logan (*Amer. Journ. of Med. Sci.*, 1873) reports a successful case. I believe it was first practised in this country, at my suggestion, by Mr. MacCormac, in 1873, at St. Thomas's Hospital. It is a resource that should be borne in mind as a means of avoiding the great violence and extensive injury which detachment from intimate adhesions to the liver and other organs would entail.

Pelvic adhesions may require special management. T. Holmes says: "Any persistent attempt to dissect or tear away the mass from the pelvis may end in laceration of the ureters or great veins, and may after all be futile. The alternatives are to pull the cyst as far as possible out of the abdomen, and apply a clamp to its neck; or to apply a clamp temporarily, cut away the cyst, tear the cut edges with the cautery, and return the mass into the abdomen; or finally to stitch the edges of the cyst to the wound in the abdomen, and leave the cavity of the cyst exposed." The first is preferable when practicable.

Walter F. Atlee, M.D. (*Amer. Journ. Med. Sci.*, 1877), relates a case, successful, in which he brought out as large a portion of the cyst as possible, clamped, cut it off, and carefully closed the wound behind it, trusting that the ovary would be sealed to the peritoneum of the ovary, and so close the peritoneal cavity.

Wounds of Intestine.—In detaching intimate adhesions the coats of the intestine may give way, or a wound may be made into it by knife or scissors, or the fingers. Wherever intestine is the seat of inflammation or adhesion it becomes extremely lacerable. The opening should be neatly stitched up with a fine needle and silk, cutting the ends of the suture short. This accident does not appear to compromise the success of the operation. I have seen several recoveries after it.

Bleeding from a surface is to be controlled as already directed.

AFTER-TREATMENT.

Rest is the great principle to be observed. To help this an opiate suppository, or an opium pill, should be given two or three times a day, to tranquillize nervous excitement and restrain action of the bowels. If vomiting occur, or indeed to anticipate it, give the patient ice to suck; bismuth or oxalate of cerium may be combined with the opium. The diet should be highly nutritious, not stimulating: beef-tea, milk, eggs, constitute nearly all that can be given with safety. Wine or spirits must be given very sparingly, and rather as means of restoring the system, if it show signs of flagging, than as a recognized part of the diet. The bladder should be emptied by catheter every eight hours.

To relieve vomiting and tympanites I have found O'Byrne's tube passed a foot or more up the rectum very useful. And the injection into the rectum of half a drachm of chloral, with a drachm of bismuth, a little tragacanth, and four ounces of milk, is of marked service in allaying irritability.

Unless local distress arise, the wound need not be disturbed for three days. On the fourth day the stump may be examined. It will commonly be found shrivelling up, sometimes even dry. The clamp may now be removed. If there be any discharge, wash lightly with weak carbolic acid, and dress with lint steeped in carbolic oil.

The abdominal wound is often firmly united in four or five days; but the sutures, if of wire, may usefully remain until the seventh or eighth before being removed. It is desirable to keep a flannel belt or binder on for some days after this.

To obviate hernia and to promote the return of the flaccid abdominal walls to due relation with the lessened bulk of contents, a well-adjusted belt should be worn for a year.

Accidents that may interrupt recovery after ovariotomy.

When bad symptoms follows ovariotomy, as pain, vomiting, fever with abdominal distension, it is probable that some fluid, blood, serum, or pus is collecting in the peritoneal cavity. It may collect in such quantity as to give rise to sensible fluctuation from one side of the abdomen to the other, or it may gravitate to the bottom of Douglas's space, and form a tense swelling behind the uterus.