further use of the knife the subperitoneal fat is exposed, the peri­toneum divided, and its free edges seized with forceps. The operator next introduces his finger and with the scissors enlarges the wound downwards or upwards on the left side of the umbilicus if neces­sary. The entire hand is then introduced between the parietal peritoneum and the tumour and swept around so as to ascertain the condition of affairs, and even to separate gently slight adhesions. A few sponges are next packed round the exposed tumour surface, which serve to keep the intestines and omentum out of the way and to retain any tumour content which may escape during tapping. With a large trocar, aided perhaps by an exhausting jar, the con­tents are drawn off', and, as the tumour collapses, its folds may be caught by forceps and the whole sac gradually pulled outside the abdomen. The pedicle is clamped by strong forceps ; the tumour is cut off ; the stump of the pedicle is carefully ligatured, the clamping forceps removed, the peritoneum carefully sponged out, more especially the pouch of Douglas, the ligature cut short, and the pedicle dropped into the cavity of the abdomen. At this stage the forceps and sponges are counted, a definite number being always employed, and, their tale being perfect, the surgeon pro­ceeds to close the wound. For this purpose his needle traverses the entire thickness of the parietes from peritoneum to skin ; the stitches should be about one-third of an inch apart, and closer apposition is gained by secondary sutures, which go through the integument alone. A dressing is now applied, and for the next few days the patient gets little else than occasional spoonfuls of hot water and milk, unless brandy be necessary, until she passes wind, after which time the usual diet is gradually resumed. It is necessary that the most precise precautions be taken against septic infection. The sponges are steeped in a five per cent, solution of carbolic acid, then dipped in boiling water, and squeezed dry immediately before use. Should the contents of the cyst be too viscid to run through the trocar, the contents of the sac must be pulled out with the hand. Adhesions to various organs must be dealt with by careful separation and ligature. Rents in the peri­toneum should be stitched up with fine catgut, and some operators also stitch over the stump of the pedicle, or bury it in a bared portion of the adjacent broad ligament, so that it may not contract adhesions. While the great majority of surgeons are at one as regards the use of antiseptic precautions, they do not agree as to the use of the spray. Many dispense with it altogether. Some employ it in the room prior to the operation. A few surgeons also, without availing themselves of the antiseptic system, appear to obtain as good, if not better, results than their fellows. It may also be noted that the antiseptic in use by different operators varies, and that, while the pedicle is usually ligatured, Keith attaches great importance to the clamp and cautery introduced by Baker Brown. The drainage-tube is not now so frequently employed as formerly. The statistical results show an increasing success in the case of every surgeon. Spencer Wells tells us that in his first five years one patient in three died, in his second and third five years one in four, in his fourth five years one in five, in 1876-77 one in ten, since the introduction of antiseptics (complete Listerism), 1878-84, 10·9 per cent,—the last series showing a marked absence of septic fatality. Keith in 1884 reported a mortality of 9·11 ; for­merly, when using the spray, he once had a successful consecutive series of 80. Koeberle up to 1878 had performed 300 operations, of which 231 had a favourable result. Of 300 patients operated on by Schroeder up to 1882 258 recovered ; in the last hundred cases there were only 7 deaths. Other figures are—Knowsly Thornton, 423 cases, 40 deaths ; Tait, 405 cases, 33 deaths, and in 1885 (in­cluding parovarian cysts) 139 cases, no deaths ; Olshausen (1885), 293 cases, 27 deaths (in the last hundred only 4 deaths).

Removal of the uterine appendages, the ovaries and Fallopian ; tubes, is performed for three distinct conditions—(1) for disease, when the tubes are the seat of inflammatory changes and dis­tended, or when the ovaries are the seat of cystic and cirrhotic changes ; (2) for fibroid tumours, in which case by operating we hasten the menopause and bring about involution ; (3) in cases where dysmenorrhoea is wearing out and rendering useless the life of the patient, and where less severe treatment is ineffectual. Oophorectomy, by which we mean removal of the ovaries only, was introduced by Battey of Georgia in 1872. It is now replaced by the more extensive procedure of Lawson Tait, sapingo-oophor- ectomy. The operation is sometimes followed by loss of sexual feeling and has been said to unsex the patient, hence strong objec­tions have been urged against it. The patient and friends should clearly understand the object and results likely to be gained. Ac­cording to Angus Macdonald, “as soon as we are certain that the ovaries or tubes are distinctly diseased and are not likely to yield to our ordinary methods of treatment . . . we are bound to at least inform our patient of the possibility of relieving her by opera­tion. The operation presents greater difficulties and is associated with a higher mortality than ovariotomy.” The greatest care must be taken in making the initial incision for fear of wounding the bowel. The organs are not uncommonly deeply placed and have contracted adhesions. Every trace of ovarian tissue should be

removed along with the tubes and the ligatures must be carried close up to the uterus. The stitches should be placed closer, since the tendency to hernia is greater.

In cases of fibroid tumour—myoma—the surgeon must be largely guided by the condition of the patient and the new growth as to whether removal of the uterine appendages is sufficient. If it is not and the patient is in such danger that the next period threatens life, he had better proceed to hysterectomy or entire removal of the uterus and appendages. When we consider the circumstances under which this operation is performed, the weakly anæmic state of the patient, the size of the tumour, and the rapidity with which procedure should be conducted, we must regard hysterectomy as one of the gravest in the domain of surgery. There is, moreover, a special danger which does not obtain in ovariotomy,—the risk of septic poisoning. Since we cut into the canal of the uterus, it is obvious that we open into a septic cavity, and it is impossible merely to ligature and drop the pedicle, since by doing so we should court failure. The surgeon, having made a way into the peritoneum, seizes and ligatures adhesions, projects the tumour through the wound, clamps the pedicle (cervix uteri), removes the tumour and uterus, and closes the wound, leaving the clamped pedicle protrud­ing. It is advisable to scoop out the septic central canal of the pedicle and carefully to pare away surplus tissue, and as dressing to have a plentiful supply of some potent non-irritating antiseptic in contact with the stump. If we take care that the septic focus is removed without coming in contact with its surroundings, if we keep the stump aseptic and dry, there will be little fear of septic fluid trickling down the side of the pedicle and causing septus, peritonitis, or blood-poisoning. Attempts have been made, by care­ful disinfection of the stump, paring its centre, careful ligature, and stitching its raw surfaces together, to treat the pedicle by dropping it into the abdomen as in ovariotomy, but as yet with no marked success. The results of hysterectomy in the hands of Keith (33 cases, 3 deaths, in 1885) stand unrivalled. Similar principles guide the performance of cæsarean section and Porro’s operation.

Affections of the liver and gall-bladder have also been treated by laparotomy. In the latter case an incision is made over the swelling, and the gall-bladder, having been exposed, may be removed or explored, gall-stones cleared out, the walls stitched to the sides of the abdominal wound, and a drainage-tube inserted as occasion requires. The spleen has also been attacked. In removal of the entire organ special care must be taken that none of the larger veins give way during manipulation. Most careful ligation and sub­division of the pedicle is requisite. In recent years the surgery of the kidney has made gigantic strides. There are three modes of reaching the organ, each of proportionate value according to the nature of the case. (1) From the lumbar region. In this way we may open abscesses, remove calculi, and even extirpate if the kidney be not enlarged. Increased room may be obtained by re­moving the twelfth rib. By this method we gain sufficient and dependent drainage and we need not open the peritoneum. (2) As in ordinary laparotomy, making an incision in the middle line. This admits of our examining both organs and to a large extent determining the condition of each. We get free access and can more readily treat the pedicle of vessels and the ureter. We open into the peritoneal cavity and again divide the peritoneum ; but our incisions are readily closed and we no longer dread interfering w,ith this huge lymph-sac. For tumours of the kidney this method is clearly indicated. (3) Langenbuch has proposed making an incision along the outer border of the rectus, which is said to present advantages in certain cases.

Since the advance of ovariotomy the possibility of removal of portions of the intestinal tract with a subsequent suture of the divided ends has been repeatedly demonstrated, and thus resections for disease of the pylorus and bowel have been successfully performed. In cases of gunshot wound, laparotomy, arrest of hæmorrhage, careful cleansing of the peritoneum, and suture of the wounded gut is now the established practice. Bull of New York reports a recovery in a case where seven wounds in the gut were sutured. All laparo­tomies are founded on the type of ovariotomy ; success depends on the fact that two opposed serous surfaces rapidly unite, and this fact must ever be borne in mind when we tear or injure the bowel and its coverings, or unite them. Sepsis is the main disaster likely to attend our interference, but with the means at our disposal, washing out the peritoneum if necessary, we should be able to obviate this.

In regard to operations on the abdominal organs in w'hich we do not interfere with the peritoneum it is sufficient to note that from the lumbar region we can reach the colon, where it is uncovered by serous membrane, the kidney, and retroperitoneal tumours.@@1 (F. M. C.)

4. *Deformities.*

(1) For club-foot, see vol. vi. p. 42.

(2) During the last few years, in consequence of the safety with

@@@1 The literature of abdominal surgery is very extensive. The most complete lists will be found in Olshausen’s “Die Krankheiten der Ovarien,” in *Die* *deutsche Chirurgie,* 1S86, and in Hart and Barbour’s *Manual of Gynaecology.*