2. *Thoracic.*

Purulent collections in the pericardium and pleural sacs may be treated as ordinary abscesses by incision. In the case of the pleural cavity the pus may be evacuated through an opening made in the axillary line at the seventh costal interspace ; but it is quite possible to empty it thoroughly at the fifth. A drainage-tube is inserted, protected by a broad flange, that it may not slip into the cavity, and strict asepsis should be secured. Should sepsis occur, the wound should be washed out, and a counter-opening made if necessary. As the lung, however, frequently will not expand, and a large cavity is therefore left to heal by granulation, with little chance of it ever getting filled up, surgeons have excised portions of the ribs in order to bring about a collapse of the chest wall and thus ensure obliteration of the cavity. The second, third, fourth, fifth, and sixth ribs have been partially removed, together with a portion of the clavicle. It is better in young people to remove the periosteum also. Some surgeons cut away the thickened pleura as well. The possibility of opening into the pleural sacs and peri­cardium for the removal of tumours has been demonstrated by König and Küster, who have reported cases where growths in connexion with the sternum and ribs were successfully removed. Special care was taken that as little air as possible should gain access to the pleural cavities. Attempts have also been made to tap and wash out vomicæ in the lung, but as yet operative interference in such instances is not fully established.

3. *Abdominal.*

Modern surgery has made its greatest advance and has achieved its most signal triumphs in connexion with operations performed in those cavities of the body which are lined by a synovial or serous membrane. The older surgeons did not dare to systematically attack the joints and the cranial, thoracic, and abdominal cavities; but the surgeon of to-day performs the most daring operations here with confidence, and is rewarded with a success which at first sight appears almost marvellous. The timid extraperitoneal manipula­tions of former days made use of in the treatment of hernia and kidney disease and in the formation of artificial anus, have now given way to systematic intraperitoneal modes of treatment, where­by we aim at the radical cure of hernia and bring disease affecting any of the abdominal viscera directly under our control. We have to consider the conditions under which wound treatment of the peritoneum is placed, and in what respect this portion of the human framework reacts upon injuries as compared with the general be­haviour. It is generally acknowledged that rest in the surgical sense, the factor necessary for healthy wound closure, is obtained by a condition of asepsis and fixation. Moreover, it is generally granted that tension as a condition of unrest is dangerous not so much in itself as in the character of the material that gives rise to tension ; hence the extravasated serum and blood in a case of simple fracture give rise to comparatively little disturbance. The presence of ascites need not lead to fever. But once let sepsis gain entrance and the fermenting exudate is resented by the organism ; violent attempts to throw it off are made ; and forms of blood-poisoning more or less severe and variable ensue. In a severe injury of the extremities, say a compound fracture, the effused serum and blood- clot are not readily removed by the damaged lymphatic system, and, when that does act, sepsis having already occurred, the ab­sorption of the putrid fluid does much harm. Fortunately the open character of the wound may allow the fœtid discharge to escape. In any case, the surgeon ensures a good result when he makes use of splints, drainage, and antiseptics. He brings about local fixation, removes the excessive exudation, and so relieves the lymphatics and prevents sepsis. In the case of a penetrating abdo­minal wound, where the healthy peritoneum is injured, we have somewhat different conditions, mainly varying in degree. It must ever be borne in mind that here we open into a huge lymph-sac. The peritoneum consists of a sheet of vascular and lymphatic network, covered with epithelium and provided with stomata. It is easily injured, and then rapid effusion ensues. Like most vascular struc­tures, however, it heals quickly with favourable surroundings, and, the source of irritation having been removed, it speedily returns to the normal. In comparison with the large absorbing surface the injured portion is but small, and the effusion thrown out at the seat of injury may readily enough be absorbed by the remainder of

the healthy sac. So long as the rate of absorption equals that of effusion tension cannot exist. If, however, the nature of the fluid be of importance, it is evident that nowhere in the body is this more marked than in the case of the peritoneum, and here above all other parts must we preserve strict asepsis. This may be gained in vari­ous ways. (1) By drainage, in which case the surgeon carefully draws off from the pouch of Douglas any excess of fluid thrown out as the result of injury, until such time as the peritoneum itself has recovered its full absorbing power and the excessive secretion has ceased. (2) Where by careful sponging the operator so far relieves the peritoneum and then, closing the wound to prevent entrance of further sepsis, leaves the rest to nature. For, if we do permit a moderate septic inoculation, it is evident that the rapid change of fluid may prove inimical to the development of septic ferments and the contact of healthy tissue will finally render impossible the existence of organisms. The presence, however, of any accumula­tion of putrid effusion is at once resented by the peritoneum and an attempt by local peritonitis may shut off the collection, or even previous to any local reaction septic absorption may prove fatal, or again severe general peritonitis may kill the patient. (3) From the above we at once see how applicable the antiseptic system must be to the abdomen, and the most signal success has crowned atten­tion to matters of detail in this respect. By means of antiseptics we can securely close the abdomen, resting assured that the peri­toneum is perfectly capable of carrying off effusions due to our interference. Where we dread that oozing may complicate matters, the drainage-tube can in addition be employed, but the necessity for its use becomes less marked as the operator acquires experience. Abdominal surgery requires from beginning to end the utmost care, and it is well that specialists reached a high standard of success before the adoption of the antiseptic system, since various points have been formulated, all of which, however, are of minor import­ance compared with the one great end in view’,—that of asepsis from first to last. The utmost care should be taken to ascertain the general bodily condition of the patient, to see that the kidneys are healthy, and to select an anæsthetic suitable to the requirements of the case. The temperature of the room, the clothing during operation, rapid dexterous manipulation, and preventives against hæmorrhage require the utmost attention. The patient should be prepared by having had low diet and gentle purgatives for a few days prior to surgical interference, so that rest of the intestinal tract may readily be assured. As a material for ligature fine silk Chinese twist, of various sizes, may be employed. It must be care­fully disinfected by boiling, and is readily preserved pure in a five per cent. solution of carbolic acid. The ends should always be cut short. It possesses certain advantages over catgut.

In reviewing the field of abdominal surgery we must study shortly the methods and results gained by ovariotomy, removal of the uterine appendages (ovaries, Battey ; tubes, Tait), hysterectomy, myotomy, removal of fibroid tumours of the uterus, intraperi­toneal operations on the kidney, liver, spleen, intestinal tract, including stomach, pylorus, duodenum, small and large intestine. Finally, attention should be given to the extraperitoneal operations for sarcoma and disease of the kidney and intestine.

From 1701, the date when Houston of Carluke, Lanarkshire, carried out his successful partial extirpation, progress was arrested for some time, although the Hunters (17SO) indicated the practica­bility of the operation. In 1809 Ephraim M'Dowell of Kentucky, inspired by the lectures of John Bell, his teacher in Edinburgh, per­formed ovariotomy, and continuing to operate w'ith success estab­lished the possibility of surgical interference, and was followed in the United States by many others. The cases brought forward by Lizars of Edinburgh were not sufficiently encouraging ; the operation met with great opposition ; and it was not until Clay, Spencer Wells, Baker Brown, and Keith began work that the pro­cedure was placed on a firm basis and regarded as justifiable. Im­proved methods were introduced, and surgeons vied with one another in obtaining good results, until by the introduction of the antiseptic system of treating wounds this operation, formerly regarded as one of the most grave and anxious in the domain of surgery, has come to be attended with a lower mortality than any other of a major character. We may now briefly outline the mode employed in operating. The room should be well heated, be free from draughts, have a good light, and above all a pure atmosphere. The patient is secured to a firm table and well protected with blankets. An- æsthesia having been obtained, the state of the bladder being known, and the urine drawn off if thought necessary, the surgeon purifies the integument with carbolic acid five per cent. solution, attending specially to the region of the umbilicus and pubes, which latter should be shaved. A large perforated waterproof sheet may be spread over and secured to the body, through which the more pro­minent part of the tumid abdomen protruding presents a localized field for manipulation ; this also protects adjoining parts and ob­viates unnecessary exposure. An incision 2 or 3 inches in length in the linea alba and midway between the umbilicus and the sym­physis pubis carries the surgeon down to the interval between the recti ; bleeding points are seized with pressure forceps ; and by a

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