THE BRADSHAW LECTURE ON SIR ASTLEY COOPER AND HIS SURGICAL WORK.

*Delivered before the Royal College of Surgeons of England
on December 7th.*

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[ABSTRACT.]

ASTLEY COOPER AND HIS CONTEMPORARIES.

The lecture contained a review of the life and work of Sir Astley Cooper. Sir William MacCormac commenced by referring to the great change which had been brought about in surgery by the discovery of anæsthetics and by the introduction of the antiseptic system. In comparing the surgery of this day and that the revolution worked by these two discoveries must constantly be borne in mind. In Cooper's early days the English school of surgery was led by Percival Pott and John Hunter, but Cooper also felt the influence of Desault, Dupuytren, Lisfranc, and Delpach in Paris, Dieffenbach in Berlin, and Scarpa in Italy. His immediate master in London was Cline. Cooper, who was born in 1768, began to lecture in London in 1791, and in 1793, when only 25 years of age, he became Professor of Anatomy in Surgeons' Hall. Formerly, anatomy and surgery had been taught by the same lecturer, but Cooper devoted himself to developing the subject of surgery into a separate course. and his lectures upon its principles and practice proved the foundation of his subsequent fame. His lectures were lavishly illustrated by dissections and preparations made by him or under his supervision. To such a degree did he carry this that South estimated that the preparations, drawings, and dissections for a single course must have cost £1,000.

Sir William MacCormac, after touching on Cooper's early researches on the membrana tympani, which gained for him the Copley medal of the Royal Society, proceeded to point out that Sir A. Cooper had made an elaborate study of the thyroid gland, demonstrated large lymphatic vessels running from it, of which some opened into the thoracic duct and the veins. It was now nearly a century since Sir A. Cooper drew the conclusion, of great interest in the light of modern investigations, that these lymph channels represented the absent duct.

HERNIA.

The Anatomy and Surgical Treatment of Inguinal and Congenital Hernia appeared in two parts in 1804 and 1807 respectively—a work replete with original observations; he found little more than a chaos of scattered facts and absurd theories where he left order and system. The treatment of gangrenous intestine came in for a good deal of attention; Cooper recommended division of the stricture, and discussed the advisability of attempting to restore the continuity of the gut, an operation which he twice performed, leaving, however, a small opening for the escape of fæces. The best practice to adopt in such cases, Sir W. MacCormac said, was still in dispute; he would himself elect in suitable cases to attempt the immediate restoration of the continuity of the bowel. In inguinal hernia this might often be accomplished at the seat of the wound, but in the femoral form it could not be readily done, except after abdominal section. Ordinary manipulative skill enabled the operator to pass a continuous suture through the edges of the divided mucous membrane, and then to introduce the number of Lembert stitches required to bring the peritoneal surfaces into wide contact with each other. This proceeding was simple, and had the inestimable advantage of being quickly accomplished. It was often better to introduce also an inner row of interrupted sutures through the everted mucous membrane after the manner of Lembert. This was the more easy as the mucous membrane always projected, and its ready involution by this method rendered the subsequent row of sutures through the serous and muscular coats more secure, since there could be no interposition of mucous membrane.

The interesting collection of cases made by Mr. Kendal

Franks showed that 222 cases had yielded a mortality of 46.8 per cent. This death-rate was doubtless too small, as many fatal cases had not been recorded, but the high rate was due not to the operation, but to the condition for which it was performed.

Another important advance on the position occupied by Sir Astley Cooper was the universal adoption in every suitable case of measures for procuring a radical cure of hernia. He had mentioned proposals which had been made for cutting away the hernial sac or tying its neck during the operation for strangulation, and had tried it in one case of femoral hernia, but another hernia nevertheless formed, so that he concluded that excision was not effectual; to ligature he saw many objections, especially the danger of peritonitis. With the modern operation under antiseptic precautions, this danger had become almost nominal. As an example of the frequency of the attempts now made to obtain a radical cure of non-strangulated or reducible hernia, Sir W. MacCormac stated that he had himself performed 90 such operations (80 inguinal, 6 femoral, 3 umbilical, and 1 ventral), with two deaths, one in a child, aged 2, from broncho-pneumonia, and one in a woman, aged 50, from cerebral embolism, neither therefore due to the operation.

The essential feature, Sir William MacCormac continued, of every operation is to seal or remove the peritoneal pouch up to the level of the internal abdominal ring, and, to ensure the absence of any pouching in this situation. Beyond this there are various methods, multiplying yearly, for the so-called closure of the inguinal canal—a closure, by the way, that can never be complete so long as the passage transmits the spermatic cord. It has seemed, however, to be of much advantage to strengthen the abdominal wall over the whole length of the inguinal canal, and for a short distance above it by a series of deep sutures. This method of passing the sutures tends to remove the somewhat flaccid condition of abdomen common in persons who are the subjects of acquired hernia, and materially increases the power of resistance of the tissues at the internal ring where the hernia is so apt to reappear, and for months after a broad hard resisting bar may be felt occupying the line of the canal, while the closure appears as solid and complete as is possible, or as it is in Bassini's, or any other of the more complicated procedures.

In cases of congenital hernia, the lower portion of the sac is cut off and left to form a tunica vaginalis for the testis. Not uncommonly an incompletely descended testis is associated with this form of hernia. It is usually undeveloped, and, if lying in the inguinal canal, may be removed with advantage. I have had occasion to do this in two or three instances, otherwise it may be pushed back into the abdomen. On the removal of the dressings, which were usually left untouched for a week, the wound was generally found to be united by first intention. The sutures are then taken out and a light dressing applied. After three weeks the patient can sit in a chair, and is soon afterwards discharged with the injunction to avoid any severe straining effort for four more weeks. I have not, except in a very few instances, ordered a truss.

I think silk is best for the buried sutures; other surgeons adopt by preference a different material. Bull uses kangaroo tendon, and he applies a light plaster-of-paris splint from the level of the umbilicus to the ankle to keep the parts at rest and further the healing process. In their paper Bull and Coley mention 40 cases, varying in age from 8 months to 14 years, where this plan had been used. All recovered from the operation; in 38 of the 40 cases absolute primary union was secured, and in nearly all the children were up and about the ward in from two to three weeks.

With regard to the risk of life it must be regarded as very small and the tabulated results of 2,283 cases show a mortality of 1.35. Lucas-Championnière, of the St. Louis Hospital, has operated on 376 cases of non-strangulated hernia with but 2 deaths, 1 from pulmonary congestion and 1 from internal strangulation, and he mentions in a letter sent to me a few months since that at that time he had operated in 120 cases in succession without a death.

In the Lariboisière, Berger had operated, up to November, 1891, on 50 cases without a death, and since then in 78 cases of inguinal hernia with 1 death; in this instance the hernia was the size of the adult head with many adhesions, and death

was due to intestinal obstruction. He notes amongst interesting complications that in one case intraperitoneal hæmorrhage occurred from the omentum; it was recognised in time, and the bleeding points secured. In 2 cases the bladder was cut into, and twice the vas deferens was ruptured. The femoral vein was also once wounded in an operation for femoral hernia, but these accidents were not attended by any serious consequences.

Bassini has operated in 262 cases with 1 death. Schede records 72 cases he had operated upon, all of which were successful. Of Kocher's 106 cases, in which 119 operations were performed, 1 died fifteen days after from embolic infarcts in the lungs. There was no peritonitis, the wound was quite healed, and the cause of death appeared to be unconnected with the operation. Eighteen were cases of double hernia, the youngest patient was 9 months, the oldest 71 years. Other surgeons have been less fortunate. Billroth, in 51 operations, lost 3 patients. Czerny a larger proportion. Wolter calculates the mortality at 4 per cent., while Leisrink, in 202 operations, had a death-rate of 7.4 per cent.; Anderegg, 3.6; and Adler, 3.5.

There is, however, evidence of increasing improvement in the details of the operative procedure, and if every precaution be taken there is no adequate reason why it should not be equally successful in the hands of all and the mortality reduced practically to nothing.

As to the duration of treatment, and manner in which the wound united, Sir W. MacCormac said that in his own cases the wound healed immediately in upwards of 80 per cent., and the duration of treatment was a little over a month. Kocher obtained healing by first intention in 89 per cent., and allowed his patients to return to work in a little over a week. Wolf obtained immediate union in 70 per cent., Billroth in 39 per cent., and Schede in 35 per cent.

As to after-results, Sir Wm. MacCormac had recently been able to show, at a clinical lecture, 18 unselected cases in which the interval after operation varied from a few weeks to nearly three years; 15 were in a thoroughly satisfactory state, and 3 only, who had worn strong trusses, exhibited a general weakness of the parts, but no actual protrusion. The results in private practice were most satisfactory; many had been under observation for years, and several had entered as cadets at Sandhurst, where they had had to undergo the severe training which military rough riding and the gymnasium entailed. In none had any return been heard of. In the whole 90 cases relapse was only known to have occurred in 4 cases; in 43 it was ascertained that no return had occurred, and in 28 of these the interval varied from two to six years.

In 112 of Lucas-Championnière's cases which he had kept under observation, 30 had gone for two years without relapse, and in 11 others the cicatrices were solid after four years and longer. Kocher obtained the final results in 94 of his cases, and found 80.8 per cent. cured, while 19.2 per cent. had relapsed. In most of these an interval of two years had elapsed, and after this the probability of subsequent relapse does not exceed 2 per cent. Nineteen per cent. of the relapsed cases were of inguinal hernia, while 33 per cent. were femoral. Berger has seen two cases of relapse in patients he operated upon before 1891, and some of these date from two to four years, while others were of shorter duration. Not one of his cases operated upon since 1891 presents any sign of recurrence. The operation he employs is a modification of Bassini's. Two hundred and thirty-nine patients, in whom 247 operations were performed by Bassini, were traced. In 47 no relapse had occurred after two years, and 108 had no recurrence after periods varying from one to four and a-half years. Schede states he found the percentage of relapses in all his cases to be 10; 2 of these were finally cured after a second operation, and 4 wore a truss. In Bull and Coley's cases, which were closely watched, only 2 relapses took place. These were ascribed to faulty operation, as the wounds suppurated and the sutures escaped sloughed out. Bull estimated the proportion of relapses as only 1 in 50 cases. The collection made by Andersen shows 50 per cent. of relapses, Socin 39 per cent., Wolter 25.9 per cent., Svenson 21 per cent., and Leisrink 20 per cent., which are much less favourable than the results previously quoted.

I think, Sir William MacCormac continued, that recent statistics go far to show that the mortality after the operation for the radical cure is practically nothing, that the wound heals quickly and well, and that probably a shorter duration of after-treatment than that usually considered necessary may be sufficient, and they also prove that a very large proportion of the persons operated upon are cured. As regards the indications for the operation differences of opinion prevail. It appears to me called for in nearly all otherwise healthy individuals in whom the hernia is wholly or partially irreducible, where it is imperfectly retained by a truss, or where the hernia is large or a source of much incon-

venience. In boys and young men, in whom the hernia is almost always of the congenital form, the operation is strongly indicated. It spares them the prolonged use of a truss, which is so little likely to cure them, and it fits them for the active occupations of life. Although youth points strongly to the desirability of the operation, yet under otherwise favourable conditions it may be properly undertaken up to late adult life. Many consider that the operation should not be performed in quite young children or infants on account of the difficulty of maintaining aseptic conditions, and the possibility of cure by a truss; but Bull, Kocher, Schede, Rushton Parker, and others have obtained the best possible results in children, and even in infants from the age of a year, or even less, upwards. Certainly I should consider the operation indicated in childhood if the hernia cannot be effectively restrained by a truss. Of course the presence of organic disease or general ill-health contra-indicates the performance of this, as it would that of any other, not absolutely necessary, operation. Success depends on the method employed, the essentials being the complete removal of the sac, a sufficient closure of the canal by buried sutures, and the rapid healing of the wound without suppuration. The comparative smallness of the hernial orifice, the limited bulk of the rupture, as also its being single, enhance the prospects of cure. Probably an insufficiently high ligature of the sac, which would leave a potential sac for the formation of a new hernia, is the chief causal element of relapse as well as the occurrence of suppuration, especially in connection with the deep sutures. Cases of hernia of great size with a wide neck and cases of double or multiple hernia frequently relapse.

SURGERY OF THE ARTERIES.

Cooper's experiments upon the ligature of arteries and the nature and extent of the collateral circulation were of far-reaching importance. He was the first to demonstrate the practicability and safety of tying the common carotid artery, and in 1817 he tied the abdominal aorta in a case of aneurysm of the external iliac artery in which sloughing and hæmorrhage had supervened; the sac was laid open, but the artery could not be found; Cooper made an incision in the linea alba 3 inches in length, scratched through the peritoneal investment of the aorta, and, with an aneurysm needle, passed a ligature round it. The patient, who was moribund at the time of the operation, succumbed forty hours later. The specimen, which Sir William MacCormac showed from St. Thomas's Hospital Museum, proved that the ligature had been applied $\frac{3}{4}$ inch above the bifurcation; the vessel was filled with clot both above and below. It was interesting to note that the most modern operations for ligaturing the great arteries in the abdomen were also done through the abdominal cavity.

DISLOCATIONS AND FRACTURES.

Sir Astley Cooper's *Treatise on Dislocations and Fractures* (1822) was a magnificent record of wide and penetrating observation, distinguishing the salient features of each injury and pointing to the most natural remedy, and Sir William MacCormac referred especially to the manner in which Cooper's researches had dispelled a cloud of ignorance and error as to dislocation and fracture of the hip.

OTHER RESEARCHES.

Sir William MacCormac referred briefly to Cooper's work on the *Anatomy of the Breast* (1839), founded on upwards of 250 dissections contained in his museum, and observed that his chapters on non-malignant tumours of the breast were distinguished by the means it afforded for separating the simple from the malignant forms. The chronic mammary tumour was well known to the present day by that name, and the description he gave of it was a model of accurate and lucid clinical observation. In his work on *Diseases of the Testicle* (1830) he had drawn distinctions of much practical importance; he showed that syphilitic and tuberculous disease of the testicle was not rare, and thus projected light into the previous darkness which surrounded the swelling known as sarcocele.

SIR JAMES PAGET ON SIR ASTLEY COOPER AS A
PATHOLOGIST.

The collection which Cooper formed in his own house was

the finest private collection in Europe, and in England unique; it was said to contain some 3,000 specimens admirably prepared and arranged, especially the injected specimens. The College of Surgeons alone possessed 500 of his preparations, and there were large numbers in the museums of St. Thomas's and Guy's. Sir James Paget, in a communication to the lecturer, wrote: "Sir Astley Cooper deserves honour for having been one of the few who, in the beginning and early part of this century, promoted the science of pathology by the study of morbid anatomy. At that time there was not in any school in London, nor indeed in any part of the country, any place for the objective study of, or teaching of pathology. Pathology, as then taught, was little more than a summary of the hypotheses which were supposed to be the foundation of practical medicine and surgery. The visible consequences of diseases were looked at in bodies examined after death, but few of them were carefully described, fewer still were reserved for more careful study. Hospital museums were unknown or neglected. The chief or only museums for morbid anatomy were private collections, as those of the Hunters had been, and among the collections in London the best was Sir Astley Cooper's. The museum of the College may show what it was, for the Council very wisely purchased it as soon as this became possible, as they did also the private collections of Longstaff, Howship, Liston, and some others. The contents of these once private museums, or the best specimens selected from them, form an important part of the present pathological museum of the College, and among them all none display so perfectly as Sir Astley Cooper's the art of showing to the naked eye morbid changes of structure in the most demonstrative manner; they remain not only as illustrations of his written works, but as admirable examples of skill in injections and in well-planned sections. Many of them are even now as instructive for study by the unaided sight as they were when first taken from the dead body, or removed by operation during life, at a period when the naked eye and the fingers were the only means for the study of pathological anatomy. It can scarcely be doubted that this portion of Sir Astley Cooper's work contributed largely to the growth of the conviction, though this growth was very slow, that morbid anatomy must be thoroughly taught in our medical schools, and a token of his influence may be seen in the present condition of our hospital museums and the almost complete absence of private anatomical collections."

Up to the last Cooper was engaged in physiological and anatomical inquiries, indefatigable in the search after knowledge and the accumulation of fresh facts and new experiences. He died at the age of 73, and his last words addressed to the friends who surrounded him were "God bless you, and goodbye to you all."

A PLEA FOR THE PERFORMANCE OF OVARIOTOMY BY OBSTETRIC PHYSICIANS,

CONTAINING A REPORT OF A FIRST SERIES OF FIFTY
OVARIOTOMIES.

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[AFTER advertizing to the frequent absence in ovariectomy records of information on such essential points as union by first intention, suppuration, sinuses, hernia, after-history, and to the influence of the practice at University College Hospital in obtaining for obstetric physicians the right to operate, the writer stated, with regard to his own operations, that there had been no selection of cases, that no tumour had been tapped by him, though six had been aspirated by other practitioners (not necessarily those given in the table), a procedure to be condemned, except under very rare circumstances. He deprecated the practice of omitting from lists of ovariectomies "incomplete" operations, and gave it as his opinion that every case in which an attempt was made to remove the tumour should be published as an ovariectomy. He had only had two incomplete operations, with broad liga-

ment cysts (Cases 6 and 8), both of which healed, and the latter of which he would now be able to remove. Primary union took place in 47 cases; some suppuration in the remaining 3, including a case of stitch-hole abscess (the only one which occurred). In no case did a hæmatocele develop after the operation, nor a ligature come away.]

After these introductory remarks, I now proceed to an analysis of the cases as given in the table. Of the fifty cases forty-four were operated upon in University College Hospital, and six were private patients, and were treated in a nursing home. The private cases are indicated in the table by a single initial letter.

The heading, "age of patient," calls for no special remarks, except that Case 46 was, at the time of operation, over 82½ years old. (See JOURNAL, December 9th, 1893, p. 1271.)

She is, as far as I know, the oldest patient upon whom ovariectomy has been performed, with the exception of Dr. Homans's case,¹ which was apparently a few weeks older. Although she only wore an abdominal belt for about six weeks after getting up, she has now a firm linear scar, without the slightest tendency to hernia, and I saw her on November 1st, 1893, in very good health for her age.

Thirty-six of the patients were married, 7 of these being nulliparous; 14 were single women. Six of the fifty operations lasted over an hour, the longest duration being 80 minutes.

I think it most desirable that operators should publish the length of time occupied by their operations. Any time beyond three-quarters of an hour adds appreciably to the danger of an operation. Yet I hear of operators taking as long as two hours and a-half or even three hours over an adherent case. My own practice is in favour of rapid removal of the tumour, but of spending sufficient time in cleansing the peritoneum, ligating the pedicle, and accurately suturing the wound. Of the 50 cases, in 15 the tumour was on the right, in 22 on the left, and in 13 on both sides.

In 33 cases there were adhesions, often very extensive and strong. (See Table.) The cases which had been previously tapped were very adherent, with one exception (12); in this there were twenty pints of fluid in the peritoneum, and nearly five in the left pleura. Drainage was employed in 11 cases; of these, 5 were broad ligament cysts; in Case 32 the abdominal wall only was drained. The peritoneal sac was drained in 5 instances only; amongst these the fatal case occurred. In this case (16) the Keith's drainage tube slipped into the abdomen, an accident which has led me to use a glass drainage tube with two large flanges, which render such an accident impossible. I believe that several of these 5 cases would have done equally well without the tube, and that drainage is resorted to far too frequently by some operators.

Flushing the peritoneal cavity has not been employed in any case; I regard it as unnecessary and even dangerous, and it seems to frequently require the subsequent use of the drainage tube. I would restrict it almost entirely to cases of encysted septic or purulent fluid.

The temperature has been taken for five minutes in the rectum, and for fifteen minutes in the axilla, every four hours by day and by night, and I have no trust in charts where it is taken less frequently. It would be useful if operators would agree to the four-hour record, and would state whether it is taken in the rectum, axilla, or mouth. On the whole, I think the axillary temperature is most convenient, but the rectal most trustworthy. The rectal temperature is, however, higher by about a degree, and sometimes two or three degrees higher, than the axillary. In the table I have stated the highest temperature recorded in the first seven days after the operation; this gives a less favourable and less valuable record than the average temperature; but I intend to treat the question of temperature after ovariectomy more fully elsewhere. The average highest rectal four-hour temperature during the first week after operation was 101.2, and similarly the average highest axillary temperature was 100.4. The highest temperature recorded, 103.4 (rectal) occurred in the fatal case just before death.

Of the whole series but 1 died (Case 16). This patient had a suppurating ovarian dermoid of the size of an infant's head, extremely adherent to the surrounding parts. She had also extensive ulceration of the rectum and descending colon; in

¹ Boston Med. and Surg. Journal, 1888.