The Anatomy and Surgical Treatment of Inguinal and Congenital Hernia. By Astley Cooper, F. R. S. &c. &c. Illustrated by Plates. London. 1804. Large folio. L. 2, 2s.

This work is already so well known that some of our readers may think it unnecessary at this time to take notice of it; but the merits of the author, and the importance of the subject, induce us to give a short analysis, and to make a few cursory remarks on its contents.

The object of Mr Cooper, in the present volume, is to give the anatomical description and surgical treatment of inguinal and congenital hernia, leaving the consideration of femoral, and the other species, to a future publication.

There is no disease where minute anatomical dissection has been more successfully employed than in the pathology and treatment of hernia; for as this complaint arises more from an alteration in the relative situation of organs than from any morbid change of structure, we must be well acquainted with the natural appearances in order to discriminate the effects of disease, or be able to point out the best means of affording relief.

Although Albinus seems to have been well acquainted with this part of anatomy, yet it is to Gimbernat, a celebrated Spanish surgeon, to whom we are indebted for the first accurate and detailed description of the abdominal, and still more particularly of the crural rings.

Mr Cooper, besides availing himself of the description these anatomists have given, advances a step farther, and describes some of the more minute parts of the anatomy of the abdominal ring with much precision and ingenuity. Neither Mr Cooper, however, nor, as far as we know, any other anatomist, has paid sufficient attention to a description of the bones of this part of the pelvis, when describing the soft parts; for we have long believed that an accurate knowledge of them will lead to a simple description, and give a clear notion of the soft parts with which they are connected. If we examine these bones, we find a ridge extending from the inferior part of the venter of the ilium, which forms the lateral parts of the brim of the pelvis, and the line of division between the pelvis and abdomen, called linea in-nominata;
nominata; and there is also another line or ridge, which begins at the rough crest or angle of the os pubis, and extends along the upper and inner edge of the bone to meet the former. The junction of the two ridges, in some subjects, is distinctly marked; but, in most bones, a small portion of the edge is rounded at that part where the femoral vessels pass out of the pelvis. Although these two ridges have been described long ago by anatomists, yet they do not seem to have explained their use, or considered them in the description of the soft parts. It will be found, however, that the pubic portion is intended for the insertion of the inflected part of the ligament of Poupart, called Gimbernat’s ligament, and the iliac portion for the attachment of the aponeurosis of the iliac, psoic, and abdominal muscles. This knowledge of the bones, and of the different parts of them into which the aponeurotic and tendinous fibres are inserted, enables us to form a clear and distinct notion of the relative situation of parts, and to be aware of the rashness with which particular names have been given to continuations or parts of one fascia, or of the same aponeurotic expansion.

The oblique passage of the spermatic cord through the abdominal parietes was well known to and elegantly delineated by Albinus. Nevertheless, no author, except Mr Cooper, has considered it with that attention which it seems to merit. After having minutely described this beautiful piece of mechanism, he points out, with a good deal of ingenuity, the necessity of taking it into consideration, in order to explain particular symptoms and varieties of inguinal hernia, to accomplish the reduction of hernia, and also in the application of trusses.

There is one part of the anatomy of which our author has not taken notice. It is the difference of the relative situation of the ligament of Poupart in the male and female. In Mr Cooper’s description no other difference is mentioned, than that the abdominal ring serves for the passage of the spermatic cord in the male, and of the round ligament in the female. Dr Monro jun. has observed a remarkable difference in the formation of these parts in the two sexes, and he has described it accurately, and delineated it in his work on femoral hernia. It may be sufficient here to mention, that this difference accounts very satisfactorily for the greater frequency of femoral hernia in the female than in the male, and for the rare occurrence of inguinal hernia in the female.

The next part of Mr Cooper’s work treats of the pathology of hernia. He describes the manner in which the sac is formed, its size, mode of descent, coverings of fascia, cellular substance, and, as he calls it, cremaster muscle. He also takes particular notice
notice of the situation of the spermatic cord, and mentions two varieties, in one of which, instead of the hernial sac passing on the outside of these vessels, it was found on their inner or pubic side. In the other instance, the vas deferens was found on the one side, and the rest of the cord on the other side of the sac.

The next chapter contains the diagnosis and the enumeration of those causes which most commonly produce hernia.

The subject of the fifth chapter is one of importance, and it is full of good practical information relative to the mode of action, application, and management of trusses.

"The object in applying a truss (says our author) is to close the mouth of the hernial sac, and destroy its communication with the abdomen; and this object can never be perfectly fulfilled by any truss which is applied in the usual manner upon the abdominal ring, and extending from it upon the os pubis. In this case the cure must be incomplete, because a considerable portion of the hernial sac remains uncompressed toward the abdomen, which portion is that situated between the abdominal ring and the opening of the sac into the cavity of the belly." He adds, "The proper method of completely obliterating the mouth of the hernial sac is to apply the truss, not upon the abdominal ring, but upon the part at which the spermatic cord, and with it the hernia, first quit the abdomen; for in this way only can a descent of the hernia be prevented entirely, and a cure by pressure, if practicable, can be performed." "Therefore, when a hernia has been returned into the abdomen by the surgeon, he should lay his fingers obliquely above and without the ring, and direct his patient to cough, and the further part from the ring towards the spine of the ilium, where the hernial sac is felt to protrude, is the point which should be noted for the application of the pad of the truss, and the instrument made accordingly."

These remarks are no less ingenious than important. There are two circumstances, however, which appear to us to be of some moment, although they have not been taken notice of by our author. They regard the strength of the spring, and the form and size of the pad. It will be found that a person who has worn a truss for many years is not able to give up using it, chiefly on account of the strength of the abdominal muscles being diminished at that part where the pad rests. The pressure of the pad seems to produce an absorption of the abdominal parietes. As this effect will always be in proportion to the degree of pressure or strength of the spring, it is of importance never to employ in any case a spring stronger than what is necessary to keep up the bowels; and it is useful for a person labouring under hernia to have two trusses of different strengths, one for ordinary purposes, and the other when riding, or when taking
taking any violent exercise. Our author advises that the pad be made of a conical form, the apex of which should rest on the internal ring or mouth of the sac. However useful this may be as a general rule, it ought to be known that there are many exceptions; and, with due deference to Mr Cooper’s opinion, we beg leave to mention, that we have found such a variety, not only in the size of the rupture, but also in the situation and size of the opening through which it passes, that we apprehend it will be necessary to vary the form and bulk of the pad according to every individual case. If the pad is too large and flat, it will prevent the bowels from passing through the external ring, but it will allow them to pass through the internal ring, and enter the inguinal canal. On the other hand, if the pad is so small as to press into the mouth of the sac, and plug it up, there is no longer any chance of a permanent cure. The bowels may be prevented from entering the sac, but the pad will act as a dilator or bougie, keep the mouth of the sac continually open, and even increase its diameter. It therefore appears to us, that, in every case of reducible hernia, a pad ought to be made according to the size and situation of the ring; that it be of such bulk and form as to make a pressure on the internal abdominal ring, along the inguinal canal, and on the external ring.

**Irreducible Hernia.**

“The following are the causes which seem to bring the disease into this state.

1. When the protruded parts are suffered to remain long down, they increase so much in size as to be incapable of reduction.

2. When membranous bands form across the sac, entangle its contents, and prevent its free motion.

3. When the protruded parts become closely united by an adhesion to the side of the sac sufficiently firm to render them immovable.”

The most efficacious means recommended by our author to accomplish the reduction of a hernia in this state, is to wear a bag truss of such a form as to keep a steady and uniform pressure on the scrotum. The pressure produces a gradual absorption of the adipose matter of the protruded bowels, and thus, after some days confinement, the tumour becomes very much diminished, and at last may be returned. The application of ice occasionally procures the return of a hernia which appears irreducible. Mr Cooper thinks that the good effects of this remedy are owing to its producing a contraction of the scrotum, which performs the office of a strong and permanent compression of the tumour, and he relates two cases where this practice proved successful.
"If the tumour be examined after death, a quantity of clear serum will first be found under the skin. The hernial sac contains a portion of bloody serum of a coffee colour. The intestine is of a chocolate brown, with here and there a black spot, which easily breaks down on being touched with the finger. A coat of the coagulable lymph, of the same colour as the intestine, may be peeled from its surface, and adhesions of no great strength are found to extend from the intestine to the sac. At the particular part where the intestine is strangulated by the constricting membrane, it is either ulcerated through, or readily pulls asunder under slight pressure. If the inflammation has been very extensive, there is a quantity of air in the surrounding cellular membrane."

"On examination after death, in strangulated omental hernia, the omentum is found scarcely changed from its natural appearance; its colour is a little, and but a little, darker than usual. I found it in some cases, even during the operation, extremely offensive to the smell; there is scarcely any fluid in the sac. Though the cavity of the abdomen is inflamed, and the intestines slightly adhering to each other, they never appear to have suffered so much as by intestinal hernia." In old and large herniae, Mr Cooper believes that the strangulation is formed most frequently by the external abdominal ring; but, in other cases, it is more commonly seated at the internal ring, the place where the spermatic vessels quit the abdomen. "So if the surgeon, during the operations for hernia, examines accurately into the seat of the strangulation, he will find, except in large herniae, cutting through the ring is insufficient to relieve the protruded parts, but he must proceed with his knife farther up towards the spinous processes of the ilium, before he can return the swelling."

"Moreover, though the abdominal ring be dilated with freedom, the hernia will, in many cases, still retain its colour of strangulation, and remain irreducible, as before; but if the sac be traced upwards with the knife, about one inch and a half, midway between the ilium and pubis, the stricture will there be found; and, when this is divided, the intestine recovers its colour, and can be readily returned."

**TREATMENT OF STRANGLATED HERNIA.**

The first object of our attention, in order to accomplish the reduction of a strangulated hernia, ought to be the position of the body of the patient. The celebrated Winflow, the first anatomist who explained many of the phenomena of disease, from
from a previous knowledge of the action of the muscles, conceived it to be of importance that the body of the patient be placed in an inclined plane, and that the thighs be bent towards the trunk of the body. Our author advises the same practice, and remarks that such a posture, by relaxing the fascia of the thigh, relaxes also the aperture through which the hernia passes. There is no doubt but every degree of tightening or relaxation of the femoral fascia will be accompanied by a corresponding change in the abdominal ring; but the motion of flexion, while it relaxes the fascia, relaxes at the same time the abdominal internal iliac and psoi muscles, and it is the change produced by the relaxation of these muscles which facilitates, and ought to be kept in view in the reduction of hernia. To be convinced of the truth of this observation, it is only necessary to observe in the dead body, when in a horizontal posture, the size of the crural ring. By introducing into it the fore-finger, a tight cord is readily felt at the upper part; when the thigh is bent upwards and inwards, the cord is relaxed, and the opening is enlarged.

The pressure which is employed on the tumour by the hands of the surgeon should always be directed upwards and outwards along the course of the canal of the cord, and our author advises it to be continued from a quarter to half an hour; besides the mechanical means, he recommends tobacco glisters and cold as the most successful in diminishing the increased action and bulk of the parts. Cold applications have been approved of by the most celebrated surgeons, and they have been particularly recommended by Mr B. Bell in the form of ice: when ice cannot be procured, our author uses a mixture of equal parts of nitre and sal-ammonia. To one pound of water in a bladder ten ounces of the mixed salts are added, the bladder tied up, and then laid over the tumour. "If, after four hours, the symptoms become mitigated, and the tumour lessens, this remedy may be persevered in for some time longer; but if they continue with unabated violence, and the tumour resist every attempt to reduction, no farther trial should be made of the application."

OPERATION.

There is not a more difficult point in surgery, or one which requires more decision, than to determine the exact period when recourse must be had to the operation. From the dreadful consequences of delaying it till the protruded parts mortify, some eminent surgeons have recommended its early performance, whilst others, from the severity and risk which always attend it, advise it to be delayed till every means have failed of procuring a reduction.
Those who urge the early performance of the operation (more particularly Deflault) have founded their opinion on the effects of a similar operation, when there is no hernia, or when the hernia is recent; for, in such cases, no serious consequences are to be apprehended, or any symptoms likely to occur more violent than what takes place after the common operation of hydrocele by incision; on the other hand, many cases have occurred, where, after repeated trials had been made to accomplish a reduction, and the operation about to be performed, the bowel has been suddenly and unexpectedly reduced.

The symptoms which ought to guide us in having recourse to the operation arise from an attack of inflammation in that part of the intestine contained in the hernial sac, and from its spreading into the abdominal cavity. It is in proportion to their violence, and after every fair and probable means has been employed, that we ought to urge the performance of the operation. Mr Cooper confiders pain on pressing the belly, and tension, as the symptoms which point out its immediate necessity. He adds, page 27, "Indeed, there is scarcely any period of the symptoms which should forbid the operation; for even if mortification has actually begun, the operation may be the means of saving life, by promoting the ready separation of gangrenous parts."

Mr Cooper has explained at great length the different steps of the operation. He directs the incision to be made from the upper part of the abdominal ring to the bottom of the hernial sac. We are warned, however, by Camper against making this extent of incision downwards, for it sometimes happens that the spermatic vessels pass on the anterior part of the lanc, and are very apt to be divided.

The sac is to be opened at its inferior part by pinching it up with a pair of forceps, and cutting the elevated portion horizontally with a scalpel.

We witnessed, in one case, a surgeon very much perplexed when he came to this step of the operation. The sac had a blue transparent colour, and looked very like a piece of strangulated intestine; the surgeon, for some time, conceived that it actually was so, and at last opened it with the utmost terror, when, to his surprise, he found it to be a thin hernial sac, much distended with water. We have seen the same puzzling appearance in the operation for hydrocele by incision, and it is one we may expect to find when either the hernial sac or tunica vaginalis is thin.

In order to divide the stricture, "the surgeon passes his finger into the sac as far as the stricture, and then conveys a probe-pointed bistoury on the fore part of the sac, and, introduc- ing it within the ring, cuts through it in a direction upwards, opposite to the middle of the sac."
Mr Cooper thinks there is an advantage from not dividing the *hernial sac* in dilating the ring, as it takes away all danger from wounding the intestine; he also makes some useful remarks on cases where there was more than one stenosis.

**OF MORTIFICATION OF THE BOWELS.**

The next chapter contains many useful practical observations on the mortification of the bowels, and on the artificial anus; also some very interesting and ingenious experiments of Mr Thomson of Edinburgh, relative to the mode of tying two portions of divided intestine.

It appears from Mr Thomson's experiments, that if the intestine of an animal be divided transversely, reunited by ligatures, and returned into the abdomen, the animal suffers no inconvenience, and the ligatures are discharged at the anus.

"However (says Mr Cooper), as the protruded parts in hernia are so much inflamed as to endanger a speedy separation of the ligatures, and as it appears from my experiments (page 35.) that the animal did not suffer from the ligature hanging from the abdomen, I should still prefer performing the operation of uniting the divided intestine in such a manner as to give an opportunity of extracting the ligatures, if any inconveniences arose from their application."

Since Mr Cooper's work appeared, an essay has been published at Philadelphia by Mr Smith, which contains a series of ingenious experiments on the wounds of intestines. The conclusions he has drawn we shall quote in his own words.

"It appears from the result of my experiments on dogs, that not only the intestine may be returned into the cavity of the abdomen, but that the ligatures may be cut off and returned with the intestine, as was observed by Mr Thomson of Edinburgh, and that we need not be under any apprehension of their being discharged into the cavity; for, by some process of the animal economy of which we are ignorant, the ligatures have, in every instance, either been discharged with the feces, or been found loosely attached to the *internal* coat of the intestine."

"It has been said by Mess. Cooper and Thomson, that there is a curious difference in the facility with which a longitudinal and transverse wound unites. But, in all the experiments which I have made, it was found that, with care, the *longitudinal* united as kindly as the transverse, only requiring a little more attention to the diet of the animal, which should be very sparing and liquid, until the wound has had time to heal. It certainly requires
requires more pains to close a longitudinal wound completely than one which is transverse. The longitudinal incision always occasions a diminution in the diameter of the intestinal canal, thereby producing dangerous obstructions. If it be of any considerable extent, probably the surgeon would be justified in cutting out the wounded portion, and treating it as a transverse division. This may be done without much endangering the life of the animal, as appears by two experiments, where three inches of the intestine were removed.

Mr Cooper next proceeds to give some account of the mode of dressing, and after treatment of the patient. He particularly takes notice of the impropriety of giving strong purges, if an evacuation can be procured by more gentle means. He enjoins the patient to be kept in a horizontal posture till the cure is complete, and shows the necessity of wearing a truss during the rest of his life.

The object of some writers to produce a radical cure by tying the mouth of the sac, Mr C. considers as ineffectual and dangerous. Although the opening of the peritoneum is shut up by such an operation, the dilatation of the abdominal ring must ever remain open.

Of Large Hernia.

Under this head our author records two important cases of large hernia, in one of which the bowels were reduced, after dividing the stricture, without opening the sac; in the other the sac was opened. The first patient recovered, the second died.

These cases, and the conclusions which our ingenious author has drawn from them, present to practical surgeons a point worthy of their mature consideration, Whether ought we, in general, to open the hernial sac? This mode of operation was first proposed by Dr Monro sen. and several cases are related in the appendix to his work on the bursæ mucosæ, where it was performed most successfully.

Of Small Hernia.

Our author remarks, that it is by no means unfrequent to meet with cases of hernia where the hernial sac is so small as not to extend through the abdominal ring; and as in such there is little appearance of external tumour, the disease is very apt to

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Vide an Inaugural Essay on wounds of the intestines for the degree of doctor of medicine, submitted to the examination of the Rev. J. Andrews, D. D. Provost (pro tempore), the Trustees and Medical Professors of the University of Pennsylvania, June 1805. By Thomas Smith, of the island of St Croix.
to be overlooked by the patient and surgeon, and some other cause assigned for the series of symptoms. The manner of operating in this form of the disease differs from that in the common scrotal hernia: the incision is to be made parallel to the direction of the spermatic cord, and the stricture will be found at the internal ring.

OF INGUINAL HERNIA ON THE INNER SIDE OF THE EPIGASTRIC ARTERY.

This variety of hernia, says Mr C., has now very often fallen under observation, and has been for more than 25 years described in the lectures delivered at St Thomas's and Guy's Hospitals.

The following note, which is translated from Rougemont, the author of the French translation of Richter's treatise on hernia, will also show that this form of the disease has not only been long known and well understood on the continent, but the same mode of operation as Mr Cooper mentions has been adopted.

"After all these considerations, I conclude with Mr Deflaurt, that the epigastric artery in inguinal hernia is commonly placed near the internal angle of the ring, and rarely towards the external. The cases where that artery is placed at the external angle of the ring in inguinal hernia are very rare, and they do not happen unless when the visceræ escape on the inner part of the ring, and then the cord is placed to one side, and a little behind the sac. I have had occasion, two years ago, to observe this distribution on a dead body; I preserved the preparation for several months, and showed it to several professional men."

Afterwards he adds,

"I believe, after what has been said, that we may be allowed to conclude that we run less risk of wounding the epigastric artery in cutting upwards and outwards, than in cutting upwards and inwards; that, in order to know exactly the situation of that artery, we ought to become acquainted with the relative situation of the spermatic cord and hernial sac; and, supposing that this is impossible, we ought to make the incision directly upwards, through the middle of the superior edge of the ring."

OF CONGENITAL HERNIA.

The author, under this head, has nothing particularly interesting to communicate, except a case described by Mr Foster, where, on dissecting carefully through the tunica vaginalis of the cord near the ring, a fluid escaped. "I then (says Mr F.) continued the incision to the bottom of the scrotum through the tunica vaginalis of the cord, and the tunica vaginalis testis, which I found to be one cavity, the edges of which being turned back on each side exposed a hernial sac pendent from the ring, and descending towards the testicle." Mr Cooper adds, "The idea I have formed of this case is, that the tunica vaginalis, after the descent
defect of the testis, became closed opposite to the abdominal ring, but remained open above and below it. That the intestines descended into the upper part, and elongated both the adhesion and tunica vaginalis, so as to form it into a bag, which descended into the tunica vaginalis below the adhesion, and becoming wide at its neck, though narrow at its fundus, it received a portion of intestine, which was too large either to be returned into the abdomen, or to retain its functions, whilst it continued in the sac."

The work is embellished with eleven plates, illustrative of the anatomy and pathology of hernia. These and the letter-presses are in very large folio, and although this size adds to the splendour of the book, it renders it so importable, and so teasing and difficult to read, that we cannot help thinking, that if the same materials had been printed in a different form, and sold at a more moderate price, it would have been more generally useful, and more within the reach of the great body of readers.

As drawings, we cannot help regretting that, situated as Mr Cooper is in the focus of the arts, he had not been fortunate enough in employing a more able draughtsman. To us they appear to be executed with great stiffness, formality, and labour; they seem not as they were drawings from the subject, but as copied from heavy brass casts.

When we compare them with Camper's drawings on the same subject, our English artist is completely eclipsed; Camper, with all the spirit and power of a master, expresses, with a single well-chosen line, what Kirtland tries to do by a hundred.

As engravings, they are well executed, but they are loaded and heavy with much unnecessary labour and superfluous work. They are far from being the chef-d'œuvres of Heath, and seem to be indebted to him for nothing but his name.

These remarks, however, apply only to the plates as works of art; with regard to their anatomical accuracy, we believe them to be true representations, and certainly they will ever be considered as a useful addition to surgical anatomy.

From this outline we have given of Mr Cooper's work, we hope our readers will be enabled to form a general idea of its contents, and to appreciate its merits. The attentive practitioner will, we venture to say, find in it much useful practical information; and the opinions and scattered observations of former authors, and of illustrious teachers, are so well arranged and so judiciously collected, as sufficiently to recommend the work to the careful perusal of every description of medical men.