and the nuclei very prominent. The concentric corpuscles seemed unaltered.

REMARKS.

It is very difficult indeed to affirm what may be the precise significance of this hypertrophy of the thymus. It might be merely an ordinary result of disturbed blood relationships, such as is found under various circumstances, and in other lymphoid tissues. On the other hand there is no reason why it should not be specially compensatory to the loss of the suprarenal, and mean a performance of suprarenal work.⁷ If so, it would be instructive from one point of view, seeing that thymus extract is antagonistic, as regards its effects on blood pressure, to suprarenal extract. As regards the spleen its enlargement suggests increased hæmolytic function.

The main point to be decided is as to the nature of the active principle in the medulla. Is it a normal secretion or is it a poisonous product separated by the gland? Now, when it is considered that extirpation of the remaining gland was so rapidly succeeded by toxæmia and death, we certainly cannot argue from any other analogies that the mere deprivation of a normal secretion would explain this. Furthermore, when it is considered that the substance (if indeed it does pass into the circulation at all, as it has not been demonstrated in the suprarenal vein) produces its characteristic effects in such minute quantities, the likelihood is still less that its absence should be responsible for death in thirty-six hours. The results of Langlois's experiments, already mentioned, support this view. On the other hand, the symptoms certainly suggest the rapid accumulation of a toxic agent in the system. And it is not in the very least likely that this toxic agent should exist in the blood as a vaso-constrictor, as Schäfer actually found upon. As a result of its decomposition by the suprarenal gland, a vaso-constricting substance may well be formed having the properties of an alkaloidal poison. The pigmentation of Addison's disease and the chromogenic properties of the suprarenal further point to a constituent of (effete) hæmoglobin as the toxic agent.

In conclusion, the available evidence goes to show that the suprarenal acts by destroying deleterious substances, and also by furnishing a material to the blood. As the work seems to be done by the medulla, there is considerable ground for regarding the vaso-constricting substance as evidence of the former function. That a small quantity of this substance passes into the circulation with the specific secretion has not been proved, and, even if it did, its speedy destruction puts any special nutritive action out of the question. The auto-intoxication sufficiently explains the intense weakness and other symptoms which suprarenal treatment does not influence, as would be expected if absence of the vaso-constricting substance was the cause.

NOTES AND REFERENCES.

¹ BRITISH MEDICAL JOURNAL, May 5th and October 14th, 1894, and also July 4th, 1896. ² The details of this work I hope to publish elsewhere. ³ *Johns Hopkins Hospital Bulletin*, September-October, 1893. ⁴ I must here express my great indebtedness to Messrs. Burroughs, Wellcome, and Co., who kindly placed at my disposal an almost unlimited supply of sheep's suprarenals. ⁵ *Archiv. de Physiol.*, January, 1893, page 24. ⁶ The gland is easily and quickly removed by the lateral operation, and without any appreciable loss of blood. ⁷ Might I here make the suggestion of trying the effect of thymus feeding in Addison's disease?

FOUR UNUSUAL CASES OF HERNIA.

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THE surgeon who has to operate upon many cases of strangulated hernia finds his appreciation of the subject increase as his experience widens. The following cases not only illustrate some of the rarer varieties or complications of hernia, but also present several features of general interest.

CASE I. *Acquired Inguinal Hernia with Hour-glass Constriction of the Sac.*—T. B., aged 69, the subject of an old irreducible, acquired, inguinal hernia on the right side, was admitted into hospital on September 6th, 1896, after some 8 or 12 hours' vomiting and abdominal pain of sudden onset. The hernia, which contained much omentum and some bowel, was not tense, and had a marked impulse on coughing. The symptoms being very urgent, it was decided to explore the tumour, as its reduction even under the anæsthetic (ether) was impossible. The hernia proved to be one with hour-glass constriction of the sac. The upper compartment, which extended for a couple of inches below the external ring, was opened and no constriction at the rings was found. The bowel, however, was nipped by

a narrowing of the sac lower down, and could not be withdrawn until this constriction had been divided from above. The intestine was congested, but not otherwise damaged. In addition to this congested loop the sac contained a large mass of omentum adherent to its walls. Its pedicle as it traversed the upper sac was long, thin, and inconspicuous. The bowel was returned into the abdomen, the omentum removed, the sac ligatured at the external ring and taken away, and the operation concluded in the usual manner. Fourteen hours and a half later the patient died from rapidly-increasing embarrassment of respiration, which began soon after his recovery from the anæsthetic. At the necropsy there was found red hepatisation of the bases of both lungs, but no sign of bronchitis. There was, in addition, carcinoma of the pylorus and interstitial nephritis. There can be no doubt that the ether was the exciting cause of his death.

The pathology of hour-glass constriction of the sac receives unequal and sometimes scant notice in the textbooks. Mr. Birkett in Holmes's *System*¹ speaks of it only being met with in congenital inguinal hernia, and there can be little doubt that a considerable proportion of these cases are associated with a patent funicular process. The constriction in the body of the sac is said to mark the point where the tunica vaginalis propria funiculi meets the tunica vaginalis of the testis. But it is equally certain that hour-glass constriction of the sac is met with in acquired inguinal hernia. Thus, in my case, the sac stripped off the testis and its tunica vaginalis in quite the ordinary way, confirming the opinion as to its acquired character which the conspicuous position of the testis on the surface of the swelling had suggested. Recently Mr. Tubby² has recorded another case in which there can be little doubt (though it is not definitely stated) that the hernia was acquired. Here also the lower sac contained omentum, and had probably done so from the beginning, and strangulation seems to have resulted from a recent slipping through the constriction of a loop of intestine.

These two cases are best explained by Hunter's supposition that the original neck of the sac is pushed down from above.³ The tendency of the original neck to descend is facilitated not only by pressure from above, but also by the weight of the herniated omentum dragging it downwards. The two varieties differ also in another way. In the acquired hernia with hour-glass constriction due to downward displacement of the original neck of the sac, the inferior division has been occupied from the commencement, whilst the upper portion is a formation of a much later date. But in the congenital condition the upper sac has been the first receptacle of the extruded abdominal contents, and the escape of a portion of them into the lower chamber may be long delayed. Perhaps this is the explanation of a difference of external contour. Mr. Birkett points out that the hernial tumour as well as the sac is shaped like an hour glass, but in the case of T. B. the constriction in the sac could not have been detected easily, if at all, by its outward appearance; nor is such a peculiarity alluded to in Mr. Tubby's case; indeed, from the description it would appear to be certainly excluded.

CASE II. *Strangulation under a Band in an Inguinal Hernia.*—B. C., aged 61, had had a hernia for 12 years, for which he had worn a truss till three months before admission. Then increasing pain made him discard it, and in the interim the swelling gradually grew larger. On March 9th he was admitted after twenty-four hours vomiting associated with a painful increase in the size of the tumour. The rupture—a right inguinal one, and acquired—was as large as a melon, and not very tense, though on deep and firm pressure there was a sensation as if a buried portion were more resistant than the rest. There was a distinct impulse on coughing, and after a hot bath and taxis the hernia was considerably diminished in size, and the pain was eased; under these circumstances, and in the belief that the hernia was only obstructed, it was decided to wait, but the next day the local conditions were unchanged. The patient had had no sleep, and taxis again failed. With Mr. Ward's approval the hernial tumour was explored. Normal small intestine was found filling the upper part of a sacculated cavity, and in places slightly adherent to the wall. Behind this lay a portion of small intestine firmly adherent to the inner side of the sac, and from the mesentery belonging to this coil a thick strong band passed to an attachment on the outer side. Beneath this band a coil of intestine 12 inches long had slipped and become strangulated. Its colour was purple, but the constriction was not severe, and had left no marked indentation upon the bowel. The band was divided, the contents of the sac returned into the abdomen, and a radical cure completed. The patient was relieved, and made an excellent recovery.

Impulse on coughing, usually absent in strangulated hernia, was present in both the foregoing cases. Its absence is usually held to point to strangulation, and its presence may make a surgeon hesitate as to the propriety of operating, or lead him to suspect the existence of an obstruction elsewhere. It is well, perhaps, to be reminded occasionally that a portion of the contents of a hernia may be strangled and yet an impulse be communicated by the unaffected coils or omentum contained within the tumour.

CASE III. Interstitial Femoral Hernia: Properitoneal.—On December 31st, 1896, I operated upon A. W., aged 39, for acute intestinal obstruction of six days' duration. The patient, who had been sent from Kendal in Westmorland, was in bad condition and of a dusky hue, and beyond relieving the vomiting and the obstruction the operation appeared to have no effect in hastening or delaying his downward course. Death took place about twelve hours after the operation. From the condition found at the operation the diagnosis of a reduction *en bloc* of a right femoral hernia seemed to admit of no question. A strangled loop of small intestine was found protruding through an opening in the peritoneum close to the femoral ring. The loop lay completely free within the boundaries of the abdominal space, though outside the general peritoneal cavity. After its liberation the finger introduced through the aperture easily found and entered the right femoral ring. In opposition to this diagnosis was to be set the fact that the patient denied any remembrance of a swelling in either groin, and though a thin man, nothing unusual could be detected externally.

The *post-mortem* examination revealed quite a different condition. An empty sac occupied the right femoral canal, but close to its peritoneal orifice a diverticulum was found lying between the horizontal ramus of the pubes in front and the peritoneum behind. It was in this diverticulum that a loop of small bowel had been caught, and the constriction had taken place at the neck, not of the diverticulum, but of the main sac from which the diverticulum arose. Instead of a "reduction *en masse*," the condition was one of interstitial hernia, a variety usually met with in the inguinal region, and a much rarer complication of a femoral rupture. But this was not all. On the left side also there was found an empty femoral sac, whose neck was not closely fitted to the boundaries of the ring, but lay somewhat loosely in the abdomen a few lines from the femoral aperture. Its orifice would admit a pencil.

There were thus two well-formed femoral sacs in a patient who not only gave no history of a rupture, but could never remember any swelling in the groin. There could be no doubt, however, that these had been acquired, for when removed the constriction that existed at the necks showed that at some time they must have been distended. It is equally certain from the loose connection that existed between the neck of the sac and the femoral ring that the sac on the left side had not been recently occupied, whilst this peculiarity probably explained the formation of an interstitial hernia on the right side. A portion of bowel could easily be conceived as entering the mobile portion of the sac internal to the fixed boundaries of the ring, but its mobility would make it difficult for the loop to penetrate the distal fixed portion of the sac. As a consequence, the distension of an included loop would lead to an enlargement of the proximal portion of the sac, and by its one-sided expansion to the formation of a diverticulum placed between the peritoneum and the parietes—in other words, to the condition known as interstitial hernia.

CASE IV. Inflamed and Strangulated Congenital Umbilical Hernia.—In January, 1899, I was asked by Dr. F. J. Coleman to see an infant 4 days old, who had at birth a protrusion of intestine into the umbilical cord for about 1½ to 2 inches. This was irreducible, and the cord was ligatured beyond it. On Monday the covering of the swelling looked to be drying up, but on Tuesday morning its surface was greenish-yellow, and evidently on the verge of sloughing. The neck, which was formed of skin, was inflamed preparatory to the formation of a line of demarcation. The swelling had increased considerably in size, and was as big as a tangerine orange, and an impulse was thought to be present. Except for the local condition, the child was apparently perfectly well. In the evening, with the assistance of Dr. Coleman and Mr. T. M. Nicholson, I opened the sac by a median incision, beginning in the abdominal wall just above the tumour. The coverings of the rupture were infiltrated with pus. There was no fluid in the sac. The cæcum was enucleated from the sloughy coverings with some difficulty owing to firm adhesions, and the adherent appendix was ligatured and cut off. The bowel was of a deep reddish, purple colour, and so much thickened that a deep tear which took place in separating adhesions did not open its lumen. Though pulled out nearly an inch, the junction of the small intestine with it was not clearly seen. The broad neck of the swelling had evidently interfered with the return of the venous blood, and had produced a broad groove upon the gut, above which the bowel was of natural colour and appearance. The sloughing coverings were cut away, and the ring enlarged upwards to permit the return of the swollen cæcum. The wound was then closed. Recovery was delayed by supuration in the wound and by convulsions, but when last heard of, four weeks after the operation, the child was quite well.

In this case the strangulation of the hernial contents was induced by their inflammation. After ligature the umbilical cord sloughed down to its attachment to the abdominal wall, showing that its arterial supply was derived from the placenta. The coverings of a congenital umbilical hernia, therefore, are sure to slough, and in doing so they must excite inflammation in the adjacent parts. Here it led to adhesions, and later, to an inflammatory swelling of the cæcum. As the walls of the bowel increased in size the circulation became gradually obstructed by the neck of the swelling, but either this

constriction had not lasted long enough to produce an effusion of fluid, or the adhesion of the bowel to the sac had been sufficient to prevent such effusion taking place into the sac. The onset of strangulation was a late incident, and this no doubt was the explanation of the absence of symptoms previous to the operation.

The statistics of Macdonald⁴ are strikingly in favour of operation. Of 31 cases 12 were treated by compress and bandage, and 9 died, 19 were treated by laparotomy, and 2 died. No doubt the time of election for operation is before necrotic changes have begun in the coverings, but even then a satisfactory result may be hoped for, as the inflamed gut, when reduced, will quickly become adherent, and will shut off the wound from the abdominal cavity. In this case it was difficult to see how recovery could have taken place spontaneously except by sloughing or ulceration of the cæcum and the formation of a fæcal fistula.

REFERENCES.

¹ Vol. ii, p. 801, 1883. ² BRITISH MEDICAL JOURNAL, October 9th, 1897, p. 968. ³ Macready, *On Ruptures*, p. 92. ⁴ Treves's *System of Surgery*, vol. ii, p. 728.

THE CYSTOSCOPE IN SURGERY.*

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WHEN blood appears in the urine we should not rest satisfied with merely naming the condition "hæmaturia," but should endeavour to discover the source of the hæmorrhage. The appearance of the urine will not give much assistance; neither will the presence or absence of clots, nor the presence or absence of pieces of growth, since clots appear alike in hæmorrhage from the kidney and bladder when growths are present, and villous fringes may come from either organ. Our only trustworthy source of information is the cystoscope, which enables us to ascertain if the source of the bleeding is in the bladder, whether hæmaturia is present at the time of the examination or not. In the case of hæmorrhage from a kidney growth it is necessary to examine during an attack, in order that we may see bloody urine, or pure blood issuing from the mouth of the ureter.

In some cases of renal growths hæmaturia may be the only early sign; the kidney may not be appreciably enlarged. In a case recently operated upon the left kidney was explored and removed merely on the cystoscopic evidence, and the cancerous kidney weighed only 4½ oz. Malignant disease of the kidney is so rapid in its growth that, if any real good is to be expected, operation must be undertaken early. Moreover, villous growths of the bladder do not always shed pieces early, and if they are allowed to grow for months or years they tend to spread over the whole bladder wall, eventually making its interior look like a Turkey carpet, when total removal is impossible. I would go so far as to urge that cystoscopic examination becomes necessary when a patient has had more than one attack of "blood in the urine." The proceeding is so simple and so devoid of risk when proper precautions are taken that there need be no hesitation in resorting to it. An anæsthetic is not required, and the proceeding is no more irksome to the patient than the passage of a bougie. If this were done in every case of hæmaturia instead of continuing the administration of so-called hæmostatics by the mouth, much suffering would be avoided and valuable time saved. In all the cases of removal of a kidney I have relied on the cystoscope for evidence as to the presence and condition of the other kidney, observing the rate of flow of urine from the ureters and its appearance, and in no case was the peritoneum opened to allow of manual examination of the kidneys before proceeding to nephrectomy. Four recent cases of bladder tumour are here appended, in which the diagnosis of the position and nature of the tumours was made by means of the cystoscope. Two of the cases had suffered for years, and had large quantities of astringent medicine with but little effect, and in the other two a state of profound

* Read before the Lancashire and Cheshire Branch of the British Medical Association.