property. "Mr. A., you have such-and-such a property to leave. I will now mention the individual names which you have specified, and when I come to the person to whom you wish to leave this property, you will assent." Here, again, blank names must be substituted and imaginary properties specified, with the object of testing whether the patient clearly understands what he is doing or not. After the patient's wishes have in this way been ascertained, that is, after all of the information which is necessary for the preparation of the will has been obtained, the draft should be carefully read over to the patient, clause by clause, imaginary clauses, as I have already stated, being from time to time introduced with the object of testing the patient's understanding power.

If the patient can clearly understand written speech, that is, can read and understand what he reads, the draft may be left with him in order that he may further consider it before the will is drawn out in full and engrossed. In drawing up the will the lawyer should endeavour to make it as simple as possible, consistent, of course, with the legal technicalities which are essential for the proper carrying out of the patient's wishes.

The process which has been indicated above is necessarily slow, and must occupy much time; it must be carried out with much care, great exactness, and scrupulous impartiality. In many cases it is not possible, when the affairs of the patient are complicated, to complete the examination and get all the details of the draft will at a single sitting; for the brain power of many aphasic patients very soon becomes exhausted. The physician should see that as soon as any symptoms of exhaustion or mental failure arise the examination is for the time stopped. The lawyers are always anxious to draft the will at a sitting, or at all events as soon as possible. Under such circumstances one is necessarily on the horns of a dilemma. But the delay cannot be helped; it is necessary to run the risk of waiting for a day or two, and, if necessary, for several days, in order that the whole process may be satisfactorily completed. And by the term "satisfactorily completed" I mean that each individual clause of the will may be clearly and definitely understood and approved of by the patient; otherwise injustice may be done.

It is hardly necessary to say that no attempt should be made to obtain the patient's instructions for a draft will or to affix his signature to a will immediately after the occurrence of an aphasic attack or just after a relapse. In such conditions the brain action is necessarily disturbed. A will drafted or executed under such circumstances could not be expected to stand.

When the will has been written out in full and is about to be executed, it must, of course, be read over to the patient in full, as a whole, and each of its individual clauses clearly explained to him—disassociated from the legal verbiage—test clauses which are not in the will being, as I have already indicated, interpolated here and there.

This procedure is, of course, specially necessary in those cases in which the instructions for the will are obtained on one day and the will executed on another (subsequent) day; for the mental condition of aphasic patients is liable to undergo rapid alterations and relapses, and the brain lesion on which the aphasic condition depends is liable to extensions and aggravations. Hence, it does not follow that, because an aphasic patient is mentally capable of making a will on one day, he is mentally capable of making a will the next day. In other words, care must be taken to see that not only is the patient mentally capable of making a will on the day on which he gives instructions for the will, but that he is also capable of making a will on the day on which he executes it (signs it).

The medical attendant should always be present, with the object of assisting the lawyer by his skilled knowledge and advice in ascertaining the wishes and desires of the patient, and of satisfying himself, if he is asked to be a witness to the will, in the interests of justice—that is, in the interests of the patient and of his friends and relatives—that the patient is mentally capable of making a will, that the instructions for the will have been correctly elicited, and that the will has been correctly executed.

It is most important, if the will is to stand, that the lawyer

should consult the medical attendant as to the procedure, the length of each examination, etc.

The medical attendant should only witness the will if he is satisfied that the patient is mentally able to make a will, that the information has been properly elicited, that the patient has clearly understood the will, and that it actually represents the patient's wishes. The medical attendant should not consent to witness the will unless he is satisfied, and prepared to appear in court to swear that he is satisfied, on these points.

REFERENCES.

¹ Questions connected with criminal procedure so rarely occur in cases of aphasia that they need not be specially considered. ² Aphasia and other Affections of Speech in some of their Medico-legal Relations, studied largely from the standpoint of Localisation, by Charles K. Mills, M.D., p. 14; reprinted from *The Review of Insanity and Nervous Disease*, September and December, 1891. ³ *Brain*, October, 1878, p. 314. ⁴ M. Legrand du Sault, in one of his important lectures on the will-making capacity of aphasic patients (*Gazette des Hôpitaux*, 1882, p. 538), lays special stress on this point. He states that in all the aphasic patients whom he examined, whether their intellectual faculties were impaired or not, he detected a diminished firmness of will which led them to assent too readily and easily (more readily and easily than they would have done when in a condition of health) to suggestions made from the outside. He states: "A l'hospice de Bicêtre, pendant treize années consécutives, j'ai observé un certain nombre d'aphasiques. Quelques-uns étaient restés aussi intelligents que l'est aujourd'hui M.X.... Mais je finissais cependant par découvrir chez eux un point vulnérable. Ainsi, il m'a paru que ces aphasiques demeurés intelligents résistaient parfois mollement à des suggestions avides et qu'ils prenaient alors des dispositions testamentaires en dehors des liens de la famille, discutables à l'occasion, qui, sans l'aphasie préalable, n'auraient peut-être pas été consenties aussi facilement. Sauf cette fermeté diminuée sur un seul point, sauf cette aptitude un peu défaillante à tester, les opérations diverses et variées de l'entendement se manifestaient dans les conditions qui ne laissaient point de prise à la suspicion pathologique." ⁵ *Lancet*, March 27th, 1897, p. 868. ⁶ *Gazette des Hôpitaux*, 1882, p. 611. ⁷ Legrand du Sault, *Gazette des Hôpitaux*, 1882, p. 538. ⁸ *The Count of Monte Cristo*, chapitre lix.

(To be continued.)

THE REMOVAL OF HIGH-LYING CANCER OF THE RECTUM BY KRASKE'S METHOD,

WITH A SERIES OF FOURTEEN CASES.

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Two or three considerations have induced me to bring this subject forward. In the first place, I cannot find that any like series of cases of sacro-coccygeal excision of the rectum has been recorded by an English surgeon. Further, the relative merits of extirpation *versus* colotomy for the treatment of high-lying rectal carcinoma seem to me to need further discussion, for, contrary to my own feelings in the matter, surgical opinion in this country, if judged by the remarks of Mr. Watson Cheyne on this subject in his recent Lettsomian Lectures, seems somewhat unduly to favour the latter, which at best is only a palliative procedure. I think that all will be agreed that in cases where we feel morally certain that the entire disease can be removed, even at some considerable risk to life, the patient should be submitted to the radical operation which holds out a prospect of getting permanently rid of the disease in some cases, whilst in others recurrence may be delayed for some years. Even if the disease manifests itself again after the lapse of only a few months and further excision is not thought advisable, one can always fall back on a colotomy.

I know of three or four cases in my own practice submitted to excision and now well and engaged in their various occupations without any sign of recurrence after periods varying from one and a-half to six years, who had been advised by hospital surgeons of repute that the disease did not admit of removal, and that colotomy was the only thing left for them. I mention this merely to show that surgical opinion has not yet grasped the fact that these cases of high-lying cancer are as capable of removal as those situated lower down.

Let me here ask: What were the conditions presented by these cases which possibly influenced these various surgeons in advising a colotomy? I think it must have been the height to which the growth reached above the anus, for in all it extended to at least 4 inches above the sphincter; in none were there any enlarged glands to be felt, nor had the disease

Mr. Swinford Edwards's Cases of Kraske's Excision of the Rectum.

No.	Date.	Name and Sex.	Age.	Where or with whom Seen.	Duration of Symptoms in Months.	Extent of Disease.	Operation.			Result.	Subsequent Condition.
							Bone removed.	Peritoneum opened.	Rector-rhaphy		
1	Feb., 1891	J. H., male	61	St. Mark's Hospital	12	Extended up for 4 ins. round entire circumference	Coccyx	No	No	Good	Seen 5 years afterwards in good health, no recurrence.
2	Dec., 1892	E. M., female	50	West London Hospital	—	Extensive annular growth. Glands involved	"	"	"	"	Recurrence after one year.
3	Feb., 1893	F. T., male	53	St. Mark's Hospital	—	Four inches of rectum involved	"	Yes	"	Death	From peritonitis.
4	Aug., 1894	Mrs. B.	30	West London Hospital		Annular growth upper limit mid-sacral region	Sacrum and Coccyx	"	Yes	Good	Rectorrhaphy failed, no recurrence to date.
5	Sept., 1894	Mrs. P.	50	Dr. Greenway	5	Growth equal in size to a ss. piece limited to dorsum	Coccyx	No	No	"	No recurrence.
6	July, 1895	Mr. S.	52	Dr. Bontor	1½	Size of a 4s. piece on right side from 2 ins. above anus to sacrum	"	"	"	Recurrence	Further excision, subsequent colotomy.
7	Aug., 1895	Mr. O.	50	Dr. Strover	6	Anterior two-thirds of rectum affected, extends from 2½ to 4½ ins. above anus	"	Yes	"	Good	Neuralgia, prolapse, no recurrence.
8	Sept., 1895	H. H., male	62	West London Hospital	10	Five inches of rectum removed	Sacrum and Coccyx	"	No	"	The growth was scirrhous, not seen him since.
9	April, 1896	E. W., female	48	St. Mark's Hospital	9	Limited to dorsum. Extends from 1½ to 2½ ins. up	Coccyx	No	"	"	Gets about comfortably with a truss.
10	April, 1896	E. H., female	42	West London Hospital	Recurrence after perineal excision two years previously	Growth reached to sacro-coccygeal level	Sacrum and Coccyx	Yes	"	"	Seen recently—is comfortable, no stricture nor prolapse.
11	May, 1896	J. G., male	63	"	12	Extensive growth, anus involved	Coccyx	No	"	"	Seen quite recently; slight tendency to contraction.
12	Sept., 1896	W. R., male	55	"	4	Growth extended to 3 ins. above anus	Sacrum and Coccyx	Yes	Yes	"	Is quite well with normal anus.
13	Oct., 1896	A. T., female	64	St. Mark's Hospital	24	Growth encircles gut and extends as high as the mid-sacrum. Enlarged sacral gland	"	"	No	Death	Was the subject of chronic bronchitis and a dilated heart; died on the fourth day, of exhaustion.
14	Feb., 1897	M. S., female	60	West London Hospital	9	Complete ring 2 ins. in depth, commencing 2 ins. above anus	"	"	Partial	Good	Still in hospital but doing well. Skin wound gaped and there has been some slight sacral necrosis.

extended beyond the rectal walls. Moreover, it has been until recently an accepted doctrine that when the upper limit of a cancer extends beyond the reach of the finger in the rectum the case is one unfit for excision. Personally I am of opinion that the position of the growth forms, *per se*, no bar to its removal. According to the height to which the growth extends so must we plan our operation. For anal carcinoma the old perineal operation suffices. Where the disease extends to the level of the sacro-coccygeal articulation behind, probably a coccygeal excision will suffice, or if more room is required the sacro-sciatic ligaments may be divided. For cases extending up still further, even as far as the pelvic brim, the removal of the lower portion of the sacrum or Kraske's operation must be undertaken.

Sacro-coccygeal excision not only lets plenty of daylight into the bottom of the wound, greatly facilitating accurate suture of the peritoneum, but enables us, in fit cases, to restore the continuity of the gut after the removal of the diseased portion.

That which really militates against the success of any rectal excision is the fact of lymphatic infection, or of the extension of the disease beyond the rectal walls, when the growth, instead of being movable with the rectum on its bed of adipose and areolar tissue, is bound down and fixed to the neighbouring parts. Where these factors are present attempts at extirpation can only end in disaster. Another bar to operative interference is, according to Mr. Cheyne, a rapidly-growing carcinoma, and in this I agree; but can we always tell from symptoms whether such is the case or not? For symptoms such as bleeding, tenesmus, pain and straining at stool, with a feeling of incomplete evacuation, often only come on when the disease must have existed for some time. If the surgeon now examines for the first time, and

finds that the cancer admits of removal, he is not likely to wait and test the rapidity of growth, nor do I think he would be justified in so doing, as delay in these cases may be of vital importance to the life of the patient. As an instance of a rapidly-growing carcinoma, let me relate briefly the following case.

M. S. (No. vi in the table) was sent to me by Dr. Bontor, of Great Berkhamsted, in the beginning of July, 1895. As I was away from town my friend and colleague, Mr. Alfred Cooper, was good enough to see him for me, when he found a small carcinomatous patch of about the size of a florin situated about 3 inches above the anus. This patient I saw about a fortnight subsequently, when the growth had doubled itself in size, and it was with difficulty that I was able to reach above it. The increase in growth was confirmed by Dr. Bontor. I performed coccygeal excision, which was unusually difficult as the patient was a very stout and big man, the rectum being at a great depth from the surface. Recurrence took place in four months, and a further excision was done, but I was not satisfied that the removal had been sufficiently free. As the disease, after a further period of six months, again became manifest, colotomy was performed just ten months after the first excision.

Now, some might say, here was evidently a case of rapid growth, and therefore one not fitted for extirpation. Would it not have been better to have colotomised the patient in the first instance? The answer is: No doubt it would have been better for the reputation of the operation, but I am not at all sure that by following the course I did ten months have not been added to a valuable life.

PRELIMINARY COLOTOMY.

As to the advisability of a preliminary colotomy, for the purpose of diverting the bowel contents from the field of operation, and thus preventing faecal extravasation into the peritoneal cavity, this was a course which I, and possibly others, recommended before I had tried or even heard of Kraske's operation, and I still think it has much to recommend it as a preliminary to perineal excision. When, how-

ever, we adopt the sacral route I look upon it as quite unnecessary, and that on the following grounds:

1. Any wound of the serous membrane can be seen and accurately closed, thus avoiding fouling of the peritoneum.

2. The loss of two or three weeks a previous colotomy entails may make all the difference between success and failure after excision.

3. It is not so likely to be followed by stricture as after the perineal operation, and therefore no subsequent colotomy is necessary; were it otherwise I should be inclined to regard it as an argument in favour of a previous one.

4. A colotomy may seriously interfere with or altogether prevent a rectorrhaphy by making it difficult or impossible to bring down the upper rectum by reason of the adhesions between the sigmoid colon and abdominal wall.

5. If not absolutely necessary, it is hard lines to saddle a patient with an abdominal artificial anus and to subject him to the risk—small as it is—of this extra operation. It might be said: "What does it matter where the artificial anus is placed? If a colotomy is performed the patient will be saved an anus in the sacral region!"

This, however, does not necessarily follow, as the end and aim of Kraske's operation is to restore the continuity of the bowel with use of the normal anus. Even where this cannot be carried out, patients seem to me to prefer the artificial anus to be placed somewhere between the folds of the buttocks, in the neighbourhood of the original outlet. It must also be borne in mind that a previous colotomy is not an unfailing safeguard against peritonitis following injury to the serous membrane during the course of an excision, as I know to my cost; for Case III succumbed to peritonitis on the ninth day after an excision, although he had previously been subjected to colotomy.

THE OPERATION.

Since the distinguished author of this operation introduced it to the profession many modifications have both been suggested and practised by such men as Bardenheuer, Heinecke, Bardeleben, Volkmann, Rose, and Roux, many of these with a view to restoring the osseous structures by a temporary resection. One very successful case of this is recorded by Mr. H. Littlewood¹ amongst 8 cases of rectal excision, 3 of them being sacro-coccygeal. As yet I have made no attempt to replace the bone—indeed, I should say that it is quite unnecessary in the majority of cases; but in those in which a complete rectorrhaphy is intended it should certainly be attempted.

It is important, in preparing a patient for the operation, to get the general health into as good a state as possible, and to clear out the bowels for some days before with aperients and enemata. As a first step in the operation I have made it a practice to wash out the rectum thoroughly with some antiseptic—sublimite solution, 1 in 2,000, for choice.

With regard to posture, I have generally used the latero-abdominal with the thighs well flexed; and in two or three of my earlier cases I substituted the lithotomy position to facilitate the dissection of the rectum from the prostate and base of the bladder. Littlewood's modification of Godlee's position has much to recommend it. He places the patient in the position used for dissecting the buttocks, raising the pelvis on a block, and having both knees flexed and resting or kneeling on a chair. I adopted this in my last two cases, and was much pleased with the good view it gave. Its drawback is that it is more difficult to keep blankets on the thighs and to protect them from getting soiled, as macintosh sheeting is very apt to slip down. It is not my intention to enumerate all the steps of the operation, but merely to touch upon those points as to which a difference of opinion exists, or further comment seems to me advisable.

After a central longitudinal incision about 6 inches in length through the soft parts down to the bone, it may be found that plenty of room is obtained by simply removing the coccyx. In Case VI, although the upper limit of the growth was on a level with the middle of the sacrum, removal of the coccyx gave ample room. If more is necessary, division of the sacro-sciatic ligaments on the left side may suffice. I have cut through the sacrum both transversely and obliquely, that is, by either Bardenheuer or Kraske's incisions as high as the third posterior sacral foramen. Whether more of the

bone can safely be removed is a question, though Volkmann and Rose appear to have divided the sacrum transversely as high as the second foramen. For the purpose of effecting the division, some use a saw; I find, however, that a chisel is much easier to work with, and more expeditious. To avoid wounding the soft parts under the bone, it is well to separate them with a periosteal elevator from the anterior surface of both sacrum and coccyx.

If any considerable bleeding takes place during the operation, it is here that we may expect it owing to wound of the middle sacral vessels. After their division they may retract and be difficult to seize, being concealed by the sacrum or what remains of it. Here it is that a good assistant is very necessary. In most of my cases I have been fortunate in having had the services of my friend and colleague Mr. Bidwell, and probably it is largely owing to his aid that I am able to report so well of the operation.

The bowel has now to be separated, in doing which it is as well after division of the levatores ani to keep to that plane of recto-vesical fascia which surrounds the gut, and not to attempt to dissect the bowel out of its bed of perirectal fat; by thus doing much bleeding is avoided and time saved. Separation of the posterior and lateral walls having been effected chiefly with the aid of the finger, it remains to deal with the anterior. I prefer now to clamp the gut well above the growth and to cut it through, in doing which the peritoneum is generally opened, when a sponge or gauze plug may be inserted temporarily and the dissection proceeded with from above downwards.

On reference to the table of cases it will be seen that I have several times in coccygeal excision avoided wounding the peritoneum; but I am not at all sure that one does not lose more than one gains by so doing—that is, if a junction of bowel is contemplated, for unless the serous cavity is freely opened it is often impossible to bring down the proximal end. As an instance of this, in Case XIV only a small wound of the peritoneum was inflicted, and although I had been able to leave at least 2 inches of the anus and distal end, I found it impossible to approximate the ends in their entire circumference.

The question of deliberately and freely incising the peritoneum and subperitoneal tissue with a view to rectorrhaphy seems to me well worthy of consideration. Personally I am inclined to think that (speaking only of cases suitable for rectal anastomosis) where one can avoid opening the peritoneum one should do so, even if it entails abandoning the rectorrhaphy; but where the peritoneum is wounded and the gut cannot be brought down without a freer division, such a course is justifiable in view of the end to be obtained.

The affected portion of the rectum having been removed and any wound of the peritoneum carefully closed with a continuous suture, one is now able to determine the feasibility of intestinal anastomosis. If there is a sufficient length of the lower end saved and too much tension is not caused by approximating the parts it should certainly be attempted, for even if not successful in the entire circumference a great deal is gained by union of the anterior part. As to the best means of effecting this I do not know that there is much to choose between a bone hobbin or direct suture. Murphy's button I have tried, but do not think it suitable to this part of the intestinal canal, and that on account of the absence of a peritoneal coat to the lower portion, so that there can be no union of serous surfaces. Maunsell's method is of course out of the question. In cases where we can be tolerably certain of performing a satisfactory circular rectorrhaphy it would be well to leave the coccyx and segment of sacrum attached by one or other border; in other words, to form a bone flap, as in the method of Roux, so that after the intestinal suture the parts may be replaced before finally suturing the skin. If the position of the growth necessitates the removal of the anus it is of course useless to attempt to close the wound excepting in its upper part over the exposed sacrum. A few sutures should fix the end of the gut to the skin margin below the sacrum, or if thought better a ligature may be passed round the bowel to occlude it, fastened to the wound and allowed to slough off, by which means the wound is kept free from fæces for some days. If rectorrhaphy has been done the wound should be well flushed with sublimate, and a little iodoform dusted in, especially

about the intestinal junction before closing it. The insertion of one or two drainage tubes is of advantage. When the wound is left open a firm packing of either bichloride or iodoform gauze forms the best dressing. This operation is naturally often followed by considerable shock, for which stimulants, a warm bed, assiduous nursing, and possibly strychnine will be required. As yet I have not had to transfuse, but it might be necessary.

AFTER-TREATMENT.

With regard to after-treatment, there is nothing special to be said, that is, speaking of simple excision cases, I do not trouble about the bowels, if they remain quiet for a week so much the better, but as a rule a motion is passed before this, in spite, perhaps, of opium which has been given to relieve pain. Most patients begin to get up and about after a month, and at the end of two are practically well. Some form of truss may have to be worn where there is either prolapse or incontinence, the latter being not infrequent where rectorrhaphy has not been successfully carried out.

I will now refer briefly to the cases, premising only that in every case the growth removed was submitted to microscopic examination which invariably confirmed the diagnosis of carcinoma.

CASE I.—In this case an iliac colotomy was done a fortnight before the excision. A full report of it is given in my joint work with Mr. Cooper on *Diseases of the Rectum*. I last saw the patient in May, 1896, that is, five years after the operation, when there was no recurrence, and the bowels were acting well through the artificial anus.

CASE II.—In this case, which was referred to me by my colleague, Mr. Heycock, after removal of the growth, it was found that several sacral glands were enlarged. These were also excised. There was recurrence after one year, of which she died without further operation.

CASE III.—A case sent by my friend Dr. Simpson, of Rugby. Here again I performed a preliminary colotomy, which gave him so much relief that I hesitated to undertake the removal of the growth, which from its extent I knew would be a formidable matter. But the patient was most anxious to be rid of his cancer, and in spite of my putting the risks of the operation clearly before him, urged me to operate. He died of peritonitis on the ninth day, and at the necropsy it was found that the peritoneum had been wounded, although but slightly, a fact which I much regret was not discovered at the time of the operation. This, the only death in my first 12 cases, was distinctly due to want of care in looking for any possible rent in the serous membrane. In those days perhaps one did not so fully recognise the importance of accurate closure of the peritoneum, for I had seen more than one case of perineal excision where the small intestine had actually protruded, do perfectly well after packing the wound with sponges freely sprinkled with iodoform.

CASE IV.—I showed this patient at a meeting of the Medical Society in February, 1895, and her case will be found at length in the 18th volume of the Society's *Transactions*. I have seen her from time to time since then; she is in every respect flourishing, of a cheerful countenance and increasing in weight. In this case I attempted a rectorrhaphy by means of a Murphy's button. The anterior wall only united, and as the anal portion merely formed a sort of *cul-de-sac* for the collection of feces, I prolonged the original dorsal wound through the anus, laying it freely open. This was the first case in which the position of the neoplasm necessitated the removal of part of the sacrum.

CASE V.—I saw this patient with Dr. Greenway, of Belvedere. Rectal symptoms had been present for about five months, but they were so slight that she could not believe that there was any serious mischief. The growth, of the size of a five-shilling piece, was situated in the lower sacral region, and it was difficult without an anæsthetic to reach above it. It was limited to the dorsal half of the gut, and was therefore most suitable for excision. As this lady had consulted several other men, one of whom advised a colotomy, another that nothing should be done, at my suggestion she saw Mr. Cripps, who fully agreed with me as to the practicability of excision after he had examined her under ether. I was able to leave the anterior wall untouched, and therefore did not expose the peritoneum. She made a capital recovery, and I have seen her three or four times since. There is no recurrence, but she is obliged to wear a pad of cotton wool and a T-bandage, and to carefully regulate the action of the bowels.

CASE VI has already been referred to. I have quite recently heard from Dr. Bontor that the colotomy is in every way satisfactory. The growth, however, is increasing and protrudes through the anus.

CASE VII.—I saw this case with his medical man, Dr. Stroker of Hoxton. The growth which had troubled him for six months involved the anterior two-thirds of the rectum; it commenced $2\frac{1}{2}$ inches above the anus, and extended as high as $4\frac{1}{2}$ inches. He had consulted a surgeon, who advised colotomy. Coccygeal excision was performed. The peritoneum was opened and carefully closed. Intestinal anastomosis was not attempted. The patient made a rapid recovery, and has put on weight. He is now troubled with prolapse, for which he wears a truss which answers well; but what affects him more is a severe form of neuralgia in the cicatrix of what was a very large wound. This comes and goes at varying intervals, though of late the attacks have been getting more frequent. It is now over a year and a-half since the operation, and there is no recurrence.

The next case is of peculiar interest, from the fact of the growth having been pronounced by Dr. Abraham, who cut sections of it, to be scirrhus. Mr. Harrison Cripps has shown that the usual form of rectal cancer is adenoma or columnar-celled epithelioma, and this is my experience; for although I

have met with more than one case of sarcoma, I have never before seen a case of scirrhus of the rectum. I can only find one case recorded—namely, by W. E. Bessey in the *Journal of Official Surgery*, Chicago, vol. iv, p. 445.

CASE VIII.—This patient, ten months previously, had first noticed bleeding at stool, soon followed by alternating constipation and diarrhoea; has generally to strain a good deal to pass anything; has been treated for urethral stricture, but never had syphilis. On examination, the rectum was strictured about 2 inches up, the mucous membrane was smooth and not ulcerated; the stricture was about 2 inches in width, and easily dilatable to the finger, which felt a cushiony induration surrounding the rectum. It seemed as though the submucous and muscular coats only were involved. The diagnosis appearing to rest between sarcoma and gumma, he was given a mixture of mercury and iodide of potash, while the stricture was dilated daily with bougies Nos. 7 and 8, lubricated with mercurial ointment. As after a fortnight matters were *in statu quo*, I did a posterior proctotomy, removing a section for examination. It cut very much as does a scirrhus of the breast, and presented a yellowish-white surface. On the day following the receipt of the microscopical report a sarco-coccygeal excision was performed, my colleague, Mr. Cheate, assisting me. A piece of the rectum 5 inches in length was removed and the peritoneum was freely opened. In consequence of the previous proctotomy no rectorrhaphy was attempted. Collapse was marked after the operation, but with free stimulation and frequent feeding the patient rallied and was doing well in forty-eight hours. The large wound granulated well, and he was discharged two months after the excision. His temperature only once reached 101° , and was practically normal for the last month of his stay in hospital. I regret that I have lost sight of him, as he has changed his address. On leaving he had no difficulty in defecation. There was neither prolapse nor sign of stricture.

CASE IX.—This case calls for no particular comment, excepting that the patient was an emaciated and very delicate-looking woman, and I feared she might not have strength to pull up after the operation, but in this I was happily mistaken. I have seen her recently; she is much improved in appearance, and, with care in the matter of regulating the bowels, she is able to get about with comfort and attend to her household duties; there is no sign of recurrence.

CASE X.—I had performed a perineal excision two years previously for malignant adenoma and recurrence had taken place. There was a nodule of the size of a walnut in the recto-vaginal septum which involved Douglas's pouch. A sarco-coccygeal excision was performed with some increase of difficulty owing to a matting of the parts following the first excision. The case did uninterruptedly well, and shows no sign of recurrence up to date.

CASE XI.—Coccygeal excision for a cauliflower-like growth which involved and protruded through the anus. The peritoneum escaped injury, but there was free bleeding from the veins about the prostate, where the growth was somewhat adherent. The patient made a very rapid recovery, and left the hospital within the month. He has now a good anus, which comfortably admits the index finger. There is no recurrence.

CASE XII.—This has, so far, been my most successful case, for, after a sarco-coccygeal excision, I was able to do a complete circular rectorrhaphy, and when last I saw the patient, six weeks ago, the wound had healed with the exception of a small dorsal fistula which was weekly getting smaller, and did not in the least inconvenience the patient. The act of defecation took place through the normal anus, and was unaccompanied with discomfort. Examination *per rectum* shows a slight linear constriction at site of suture, that is, at about 2 inches above anus. As I was unsuccessful in Case IV with Murphy's button I tried direct suturing without any mechanical contrivance, and the result has undoubtedly been good.

CASE XIII.—This case was sent to me by Dr. Wright of Rochester. The patient had been troubled with bleeding for two years, though it was only during the past year that pain was complained of. The growth was extensive, and there was one enlarged sacral gland, for so a nodule felt at the examination proved to be. Assisted by my colleague, Mr. Wallis, I did a sarco-coccygeal excision, adopting Littlewood's genu-pectoral position, which much facilitated the operation, nor did this posture in any way interfere with the administration of ether, so Mr. Lloyd, our chloroformist, informed me. I removed several enlarged glands, but was unfortunately obliged to leave an indurated chain of lymphatics running up above the pelvic brim. There was considerable collapse after the operation, from which the patient partially rallied. However death occurred on the fourth day of exhaustion and cardiac dilatation. It is evident that this was a case unfitted for operation, taking into consideration the possible involvement of glands, and the history of chronic heart and lung mischief. The fact is, on the one hand I was deceived by her appearance of health, and on the other I hoped that the nodule referred to would prove to be part of the growth and not lymphatic.

CASE XIV is the case of a wiry female, aged 60, who had presented symptoms for nine months. On examination I found a complete ring of carcinoma 2 inches in depth, its lower margin being 2 inches above the anus. I adopted the same position as in the last case, and was again well satisfied with it. In order to get well above the growth I had to remove rather more of the sacrum than usual by means of a second resection, but I am unable to say the exact height to which I went. About 3 inches of the mid-rectum were removed. As the peritoneum was not freely opened I was not able without undue tension to effect a complete rectorrhaphy, but contented myself with suture of the anterior half, which has united well. The upper part of the skin incision which had been sutured broke down, leaving the sacrum exposed covered with granulations. As this condition still persisted six weeks after the operation, under ether I freed and pared the skin flaps, scraped the granulations, found and removed two small sequestra which had evidently prevented healing, and resutured the wound. This patient is now about to leave the hospital. Her bowels act well, and there is neither prolapse nor stricture.

A summary of the above shows that out of 14 cases there were 2 deaths—that is, a mortality of a little over 14 per cent.; 2 recurrences—I in two years and 1 in four months; 10 living and well, of these 1 is in good health after five years,

2 in good health after nearly three years, 1 after one year and nine months, 3 after one year, 1 after six months, and 1 after three months; 1 case has not been seen since leaving the hospital.

E. H. Taylor, of Dublin, in an excellent article in the *Annals of Surgery* for April of this year, states that the mortality of this operation is from 20 to 25 per cent., whilst Cheyne, in his lectures already referred to, estimates it at from 18 to 20 per cent. He says: "The mortality varies considerably between the perineal and sacral operations, being naturally higher for the latter." In this I must agree with him, for out of many cases of perineal excision I have not had a death. He further says that König's total mortality is 38 per cent., Billroth's 34, Kocher's 28, Albert's 18; Iversen's estimate of Kraske's operation 25 per cent., and Czerny's 19.4 per cent. I have not been able to find any statistics regarding the work of British surgeons. Ball, in the second edition of his work, states that he has had four cases, which were all cured, and Littlewood's three cases I have already mentioned. Allingham, in his last edition, says he has performed the operation several times, but with what result is not stated, whilst I can find nothing on this subject from the pen of Harrison Cripps, a pioneer in the perineal operation.

In conclusion, I would remark that, owing to the enterprise of our Continental brethren, the field of operable cases of rectal cancer has been very considerably widened. Many patients, on whom even the most heroic would have refused to operate by the perineal route, can by Kraske's operation at least be relieved of their disease, and in a few of these the normal functions of the part may even be restored. The mortality, high as it is on the Continent, is decreasing, whilst in Great Britain, as far as I can learn, it is not more than twice that of the perineal operation; so that with extended experience, a more careful selection of cases, and strict attention to antiseptics, we may confidently expect it to become yet lower.

REFERENCE.

¹ *Lancet*, September 12th, 1896.

ON THE EMPLOYMENT OF DEAD BACTERIA IN THE SERUM DIAGNOSIS OF TYPHOID AND MALTA FEVER,

AND ON AN EASY METHOD OF EXTEMPORISING A BLOWPIPE FLAME FOR MAKING CAPILLARY SERO-SEDIMENTATION TUBES.

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THE utility of the method of serum diagnosis of typhoid and Malta fever has now been so firmly established, and the technique of this method is now so simple that this method of diagnosis will probably be everywhere employed by clinicians who have at their disposal pure cultures of the bacillus typhosus and of the micrococcus melitensis of Bruce, and who have further at their disposal a supply of culture media and an incubator and a microscope, or in default of a microscope a supply of capillary sero-sedimentation tubes.¹ Simple as this equipment may seem, there are very few practitioners at home, and there are practically none abroad, who have all these requisites at their disposal. We therefore consider that it may not be without interest to draw attention to the fact that the whole apparatus of culture media and incubators can be dispensed with by employing instead of living cultures of the bacteria of typhoid and Malta fever dead cultures of these same bacteria. These dead cultures can be very conveniently carried about or sent by post in sealed glass capsules.

The fundamental observation in connection with this question, and the suggestion that this observation might be turned to practical account, is to be found in a paper by Widal published in the *Presse Médicale* of September 30th, 1896. Widal showed that the agglomeration which is obtained when the diluted serum of a typhoid patient is brought in contact with a living culture of bacteria is obtained in an equally characteristic manner when the serum of the patient

is brought in contact with a culture of bacteria which has been killed by exposure to a temperature of 60° C.

We have repeated this observation of Widal's, and have found that it is perfectly accurate. We have further found that it holds true also of the micrococcus melitensis of Bruce. We employed in our test experiments "emulsions" of fresh agar cultures of the respective bacteria. In each case these emulsions were drawn up into small glass capsules similar to those which are employed for bacterial vaccines; these capsules were then exposed in a water bath to a temperature of 60° C. for a period which varied from five to ten minutes. The capsules of dead bacteria² were then put aside in a cupboard for three to nine weeks. After the expiration of this time their contents were thoroughly shaken up, and they were then employed for purposes of serum diagnosis. The serum, which was employed in the test experiments reported below, in the case of the micrococcus melitensis, was derived from a case of Malta fever which is at present under treatment in the Royal Victoria Hospital, Netley. The serum, which was employed in the case of the typhoid bacillus, was furnished by one of us, who vaccinated himself against typhoid some six months ago, and whose blood in consequence of that vaccination exhibits a typical sedimentation reaction in dilutions of 1 in 10 to 1 in 100.

In the case both of the bacillus typhosus and of the micrococcus melitensis the mixtures of diluted serum and dead bacteria were examined both under the microscope to elicit the agglutinative effect, and also in capillary sero-sedimentation tubes to elicit the sedimentation effect. In each case control experiments were made in which dilute specific sera were mixed with perfectly fresh living cultures of the respective bacteria. In each case also further controls were made with mixtures of dead bacterial cultures with non-specific sera.

Microscopical examinations showed that the cultures which had been killed by heating to 60° C. did not differ in any marked way from the living cultures. There was no trace of clumping in the dead cultures, and the movements of the isolated bacteria did not in any case differ strikingly from those which were seen in the living cultures. Close attention, however, revealed that in the case of the typhoid bacteria no progressive movements occurred in the heated cultures. In the case of the micrococcus melitensis it was impossible to be sure that there was a qualitative difference between the movements in the living and in the dead cultures.³

Comparative microscopic study of the effects produced by adding dilute specific sera respectively to dead and living cultures of the bacillus typhosus and the micrococcus melitensis, did not reveal any differences in the method in which agglomeration occurred in the respective specimens.

The experiments which were conducted in capillary sero-sedimentation tubes gave even more interesting results. These results are given on the next page in tabular form:

The following points in these experiments appear to deserve attention:

1. It is interesting to note that the sedimentation which occurs when a dead bacterial culture is mixed with a specific serum can be readily distinguished from the deposition of bacteria which sooner or later occurs in every dead bacterial culture. The specific sedimentation can be distinguished not only by the fact that it occurs infinitely more rapidly than the deposition of bacteria which occurs in the unmixed bacterial culture, but further by the fact that the sedimentation which is produced by an admixture of a specific serum is floccular and unevenly disposed as contrasted with the impalpably fine and perfectly evenly disposed deposit which takes place in the unmixed dead culture. These differences in appearance are, of course, correlated with the fact that the deposit in the case of the specific sedimentation is a deposit of agglomerated masses of bacteria, whereas in the case of the unmixed culture the deposit is a deposit of individual bacteria.

2. It is further interesting to note that, contrary to what might have been expected, the specific sera did not exert any greater effect upon the dead bacteria than upon the living bacteria.

It is almost unnecessary to dilate upon the great practical importance of the method of diagnosis by means of dead