intermissions, the longest period of freedom from pain being three to four weeks. The pain had been worse since January, 1905; and two weeks before admission to the hospital in April, so severe as to compel him to give up work. About six weeks before admission he had a sudden attack of faintness; the next day the motions were black and tarry. For some time he had taken nothing but milk and Benger's food. The pain was referred to the epigastrium, and occasionally extended round to the right scapular region. No vomiting. Physical examination gave negative results, and there was no tenderness on pressure over the duodenum. Examination of a test meal gave a good percentage of hydrochloric acid. During the month of April the patient was under the care of my colleague Dr. Bertrand Dawson, who made a diagnosis of "duodenal ulcer." Relief followed rest and dieting, but the pain returned soon after his discharge, and he was admitted under my care with a request from Dr. Dawson that I would consider the advisability of performing an exploratory gastrotomy.

Operation.—On June 6th, 1905. Median incision. The stomach, which was somewhat distended, was turned upwards and the transverse mesocolon divided. A horizontal incision sufficiently large to admit the whole hand was made in the posterior wall of the stomach. Nothing abnormal having been found on the cardiac side, the forefinger was passed through the pylorus, when a large ulcer was found occupying the whole of the posterior wall of the duodenum, its upper edge being about $\frac{1}{2}$ in. from the pylorus. The base of the ulcer was very soft, irregular, and ragged, and seemed to be partly formed by the eroded head of the pancreas. Part of the incision in the stomach was sewn up, the remainder being united to an opening in the jejunum in the usual way.

After-History.—The patient took the anaesthetic badly, and was very sick after the operation, but the subsequent course of the case was uninterrupted by any incident.

Reviewing these two cases after the nature of the disease has been made known the symptoms may appear fairly conclusive of duodenal ulcer, but the diagnosis was at best a conjecture. Both had dyspepsia, pain two to three hours after meals, and melaena, and both were males; but there was no point of deep tenderness over the region of the duodenum. The absence of haematemesis also favoured the diagnosis of duodenal ulcer. Vomiting was absent in the second case, and only occurred late in the first.

Obviously any operative procedure in cases such as these must include a preliminary examination of the stomach and pylorus, and in view of gastro-enterostomy being required, this I invariably do through the posterior wall of the stomach unless this step is contraindicated by adhesions.

Gastro-enterostomy for duodenal ulcer may be indicated, as in the cases above related, for irremediable and persistent pain and dyspepsia; for constriction, which was commencing in the first case; for recurring haemorrhage; or as a second step after closure of a perforated ulcer.

This operation will act in precisely the same manner as when performed for ulceration of the pylorus; that is, by setting at rest the affected portion of intestine and by freeing it from the passage of acid gastric contents, and, in the case of constriction, by permitting the stomach to empty itself.

Regarding the actual operation it is advisable to make the incision as low as possible in the posterior wall, in order to admit of good drainage; to leave no "slack" of jejunum; to employ anchoring stitches on the distal side to prevent kinking; and finally to stitch the edges of the opening in the transverse meso-colon to the posterior wall of the stomach.

After passing the finger or even the whole hand into the stomach some difficulty may be experienced in finding the pylorus. This arose in Case II. The hand passed up into the cardia, and on being carried to the right was prevented from reaching the pylorus by a vertical folding of the lesser curvature, running from before backwards, which had to be dipped under before the pylorus could be found.

ACUTE SALPINGITIS

CAUSED BY AN INFLAMED APPENDIX BURSTING INTO THE MOUTH OF THE FALLOPIAN TUBE.

By J. BLAND-SUTTON, F.R.C.S.,

Surgeon to Middlesex Hospital and to the Chelsea Hospital for Women.

THE recognized complications of appendicitis are many and various; so are the routes by which an appendix-abscess finds a vent. This communication refers to a case in which an inflamed vermiform appendix perforated, and the inflammatory products were discharged into the right Fallopian tube through its coelomic ostium. In February, 1905, I saw, with Dr. R. Ironside, an unmarried lady, 30 years of age, suffering from pelvic pain accompanied with acute febrile signs clearly indicating the existence of acute inflammation. On careful examination a tender swelling was felt on the right side of

the uterus and we felt some difficulty in deciding whether it was a tubal swelling (acute salpingitis) or an abscess connected with the vermiform appendix.

A few days later an operation was performed. The abdomen being opened by a median subumbilical incision, the vermiform appendix could be seen adherent to the fimbriated end of the right Fallopian tube; the tube itself was distended and adherent to adjacent structures. I successfully excised the appendix, the tube, and ovary without disturbing their relationship (see Fig. 1). When the parts had been

Fig. 1.—An inflamed vermiform appendix adherent to the coelomic ostium of the right Fallopian tube.

carefully hardened I made a section through them, as shown in Fig. 2. The lumen of the tube was filled with pus; its coelomic ostium had been firmly occluded and the fimbriae were withdrawn into the lumen of the tube; a narrow channel led from the interior of the appendix through its wall, near the tip, directly into the lumen of the tube.

Fig. 2.—The parts represented in the preceding figure shown in section. The vermiform appendix has a perforation near its tip communicating with the lumen of the tube. The fimbriae curled up in the tube are well shown. The tube was distended with pus.

The course of events in this case seems clear. The appendix, as so often happens, occupied the true pelvis, its tip lying in contact with the tubal fimbriae. The appendix became the seat of inflammation which involved the Fallopian tube and led to occlusion (salpingitic) of its coelomic ostium; finally, the appendix perforated and the morbid matter inundated and distended the Fallopian tube. Adhesion between an inflamed vermiform appendix and the Fallopian tube is common, but this is the first example which has come under my observation in which perforation occurred directly into the mouth of the tube. The patient recovered without difficulty or drawback.

CASE OF CUTANEOUS ANTHRAX TREATED WITHOUT EXCISION WITH SOLAVO'S ANTI-ANTHRAX SERUM: RECOVERY.*

By WILLIAM MITCHELL, M.B., C.M. EDIN.

SINCE Dr. T. M. Legge, H.M. Medical Inspector of Factories, brought the subject of the serum treatment of anthrax in man before this Society last June there has been a small epidemic of anthrax in Bradford, and several opportunities of testing the value of this method of treatment have arisen.

As I have had the opportunity of using the serum on what, it appears, has been the third case in England, where it was

* Read before the Bradford Medico-Chirurgical Society.

used without excision, I thought it might interest this Society to hear the notes of the case.¹ The serum of Professor Sclavo is prepared by a combined process of active and passive immunization applied to the ass during a period of about two years. The serum is then separated from blood taken from the jugular vein, and is prepared and tested in the usual way. It is claimed for the serum that:

1. In very large doses it is harmless.
2. It can be borne well even when injected into the veins.
3. No case taken in an early stage, or of moderate severity, is fatal if treated with serum.
4. That with the serum some cases are saved even when the condition is most critical and the prognosis almost hopeless.
5. When injected into the veins the serum quickly arrests the extension of the oedematous process so as to reduce notably the danger from suffocation which exists in many cases when the pustule is on the face or neck.
6. If used early enough it reduces to a minimum the destruction of tissue.
7. In some situations of the pustule, such as the eyelid, it must be used in preference to any other treatment.
8. Persons attacked by anthrax, when treated with serum, appear convalescent in the course of a few hours.
9. In internal anthrax intravenous injection of serum affords the only hope there is of recovery.

How the serum acts is a much debated question. A number of authorities refuse to admit that it can act as an antitoxin, that is, as a neutralizer of a specific chemical toxin, generated by the anthrax bacillus—because, they say, it has not yet been demonstrated that the anthrax bacillus does produce a specific toxin. Pure cultures of anthrax, they say, when filtered to remove the bacilli themselves and any spores there may be, may be injected into animals without producing any intoxication, hence they say there can be no special anthrax toxin analogous to the toxins of tetanus and diphtheria. But, of course, though this may be true as regards cultures of bacilli *in vitro*, it does not follow that it is true as to the multiplication of bacilli in animal tissues. Sobernheim considers that the serum is bactericidal, but against that is the fact that the serum does not retard the growth of, much less kill, cultures *in vitro*. Metchnikoff attributes the result of the serum to phagocytosis. Sclavo himself inclines to the view that the results are due to the stimulation by the serum of a defensive phagocytosis which leads to an extermination of the anthrax bacilli in the body. Were the serum merely antitoxic, he holds that large doses of a weak serum would have the same effect as a smaller dose of a strong serum; but this is not so. A powerful serum is curative, but no quantity of a comparatively weak serum is effective, probably because only the powerful serum is capable of exciting chemiotaxis.

Radziewsky has shown that when an animal is infected with anthrax the bacilli rapidly increase in number up to a certain point; then, as the animal organism begins to react to the infection, large numbers of the bacilli are killed by a protective bactericidal substance fabricated by the cells of the body. If now we assume that the anthrax bacilli contain in themselves an intercellular toxin, which is liberated and becomes active only on the death and disintegration of the bacilli, we can then understand that in a case of anthrax which has advanced to the stage at which large quantities of the bacilli are being killed, the death of these bacilli may set free sufficient toxin to poison the infected animal and so cause its death. The use of the serum, according to Radziewsky, would therefore be to supplement the automatic manufacture of antitoxin sufficiently to enable the bacilli to be killed off before their number was so great that, from their death, sufficient poisonous substance would be liberated to be fatal.

But if this view of Radziewsky were correct then the use of the serum would be limited to early cases only, and in late cases, where bacilli were already present in large numbers, the serum might conceivably be the indirect cause of death, as by killing them off it would at once set free a large and lethal dose of toxin. However, as some advanced cases of the disease seem to have been benefited by the serum, it would appear that the bactericidal theory alone will not explain the action of the serum. Probably it acts both as a direct antitoxin by chemically neutralizing the toxin already produced, and as an indirect antitoxin by virtue of its direct or indirect bactericidal effect. According to the work of Drs. Wright and Douglas, it may act as an "opsonin," making the bacilli more palatable to the phagocytes; but after all, this latest notion

of the bacteriologists does not appear to me to carry us any further on the road to understanding the action of antitoxins than we were years ago.

On January 31st, 1905, I was called to see J., aged 25, a wool carder. Two days previously she had noticed a small red papule on the left upper eyelid which had gradually got larger and was accompanied by oedema of the eyelid and to a slight extent of the left side of the face. The history was that she had been for nearly three weeks employed in carding English wool, but for a day and a half previous to that she had been employed amongst Persian wool, and for a month before that amongst mohair of a very short and dirty character, which had, however, been subjected to the process of washing before she had to handle it. When I saw her first there was a pustule about $\frac{1}{4}$ inch in diameter on the centre of the upper eyelid. It resembled a vaccination mark as seen on the seventh day; it was slightly pitted or umbilicated in the centre where there was a small dark spot; round its margin there was a ring of indistinct vesicles which ran into one another like a vaccination mark, but were of a dirty yellow ochre colour, in place of the pearly-white vesicles seen in vaccination. The temperature was 99° F., the pulse 90, and the respirations 16; the tongue was slightly covered with whitish fur. I pricked the vesicles, but found no pus. I then punctured the swollen eyelid, thinking there might be deep-seated pus, but finding that only clear watery serum exuded I at once suspected anthrax and asked Dr. J. H. Bell if he would see the case with me. This he did the same day, and kindly brought three tubes of Sclavo's serum. He agreed with me that the case was one of local anthrax and advised me to inject subcutaneously 20 c.cm. of the antianthrax serum, which I did at once.

Fluid from the vesicles and exuding from the puncture on the eyelid showed, microscopically, the characteristic anthrax bacilli in large numbers.

On the following day, February 1st, the temperature was 101° F., the pulse 120, and the respirations 20; the tongue was thickly furred; the face very much more swollen. I then administered the remaining 10 c.cm. of Sclavo's serum, which was all I had. Locally compresses soaked in mercury perchloride, 1 in 4,000, were applied to intercept the watery serum which was running down the face and threatening to enter the mouth. Having acquired considerable confidence in the use of sodium salicylate in all septic conditions I now gave 10-gr. doses every three hours, and continued them throughout the illness. In the afternoon of the same day Dr. Legge, H.M. Medical Inspector of Factories, kindly saw the case with me, and brought me a further supply of 70 c.cm. of serum, of which I injected 40 c.cm. at once.

On February 2nd the swelling, both of the eyelid and of the face and neck, was less, but the upper eyelid had become of a dark red colour, with here and there blebs containing a purple-coloured fluid. The temperature was 101° F., the pulse 125, and the respirations 18; the tongue was cleaner, and the patient felt more comfortable. Twenty c.cm. serum was now given. Serum taken from the blebs at this time and tested on a white mouse proved virulent, and, *post mortem*, bacilli, indistinguishable microscopically from anthrax, were found in the blood expressed from lungs and spleen. On the following day, February 3rd, the swelling was much less; the patient had slept at intervals during the night and was feeling much better. The temperature had fallen to 100° F., the pulse was 115, and the respirations 18. At this stage 10 c.cm. more antitoxin was given, making in all 100 c.cm. which the patient had received; after this no more was administered. On the afternoon of the same day the temperature was 101.6° F., the pulse 115, and the respirations 17. The swelling was much less marked on the right eyelid and lips, but more marked on the same side of the neck.

On February 4th the temperature was 99.8° F., the pulse 108, and the respirations 17; the tongue was thickly furred, but moist. She had had a restless night, but the swelling of lips and neck was much less, although a good deal was still present on the forehead, root of nose and right eyelid. On the left eyelid a distinct line of demarcation had formed around the affected area, which embraced practically the whole upper eyelid up to the eyebrow, and a half-moon-shaped area about half an inch wide on lower eyelid. The area of necrosis was getting black, dry, and hard, and the surrounding tissues were reddened and indurated. Shooting pains, the first complained of, were now felt in the eyelids.

On February 5th the swelling of the whole face was much less, excepting the tissues immediately surrounding the necrosis; there was no expansion of the necrotic area; she

had had a good night. The tongue was clean; the temperature was 97.4°, the pulse 100, and the respirations 16.

On February 6th the pulse was 84, the temperature 98.6°, and the respirations 16; she had had a good night.

On February 7th the pulse was 74 and the temperature 97°; she had again had a good night and was feeling better.

From this time on her recovery was uninterrupted and uneventful. I regret to say, however, that the serum has not fulfilled expectations as far as preventing necrosis is concerned. There is complete ectropion of the upper eyelid, so that later on some plastic operation will be necessary; all the tissues superficial to the cartilage seem to be gone in the upper eyelid; but that is comparatively a small consideration, and the patient is to be congratulated on being alive at all. As to what influence Sclavo's serum had in bringing about recovery, it is impossible to say. I was unable to note anything that could be called a marked reaction after its use. Cases occasionally got well spontaneously in the old days, and it is just possible that this case got well simply *post hoc sed non propter hoc*. On the other hand, when we take into account the favourable results obtained in Italy with the serum, and the few cases recorded in this country, I think that we are justified in hoping that a remedy for this dread disease has at last been found.

Photograph eight weeks after commencement of disease showing amount of ectropion after complete cicatrization: A, upper ciliary margin; B, swollen conjunctiva, ocular; C, everted inner surface of upper eyelid; D, outer end of cavity left by separation of slough; E, area from which necrosis of lower eyelid separated, showing oedematous lower eyelid above it.

Mr. Bowlby and Dr. Andrewes of St. Bartholomew's Hospital, in their report of a case in the BRITISH MEDICAL JOURNAL of February 11th, state that the oedema increased after the use of Sclavo's serum in both the cases treated by them, and they attribute this to the liberation of an intercellular toxin from the disintegrated bodies of the bacilli. These dead bacilli they found chiefly enclosed in leucocytes. In my case there was also more swelling after the first dose of serum. Compare this with the claim, No. 5, of Dr. Legge that it quickly arrests the extension of the oedema. Mr. Bowlby and Dr. Andrewes also state, in connexion with their second case, that nineteen hours after an injection of 40 c.cm. of Sclavo's serum, fluid taken from the vesicles was sterile as far as anthrax bacilli was concerned. This is not in accordance with my observations, as I have shown that fluid from the vesicles after the administration of 70 c.cm. in all, and three days after the initial dose of 20 c.cm., proved virulent when tested physiologically.

In conclusion, I would mention that large initial doses of 50 to 60 c.cm. afford the best results, but whether the new treatment will stand the test of time or not remains to be seen. In the present state of our knowledge, it does not seem justifi-

able to treat a case of cutaneous anthrax with serum alone and without excision, provided that the pustule is anatomically situated in such a way as to render excision possible. Better to wait for cases such as this, where excision was impossible or practically so, than to willingly omit any procedure which is calculated to save life.

REFERENCE.

¹ See Dr. Legge's Milroy Lectures, BRITISH MEDICAL JOURNAL, 1905, for fuller particulars.

A SPOON-ELEVATOR FOR RAISING THE PELVIC FLOOR.

By J. LYNN THOMAS, C.B., F.R.C.S.,
Cardiff.

DR. GARSON, in 1878, made an important communication to the *Edinburgh Medical Journal* upon the "displacement of bladder and peritoneum by distension of the rectum." Soon afterwards the suprapubic operation for removal of vesical calculi was resuscitated, and for a time Petersen's bag enjoyed great popularity for lifting the base of the bladder by distending the rectum; it was also used in operations for removal of vesical tumours, but before long it was discovered that its use was not devoid of danger, and that it also caused increased congestion of the bladder by its pressure on all the blood vessels of the rectum.

Owing to the recent successful introduction of the operation of removal of the prostate by the suprapubic route, the surgeon has often wished he could supplement fingers in the rectum by an instrument which would answer the same purpose, although Dr. Eugene Fuller is able to perform his prostatectomies with marked success by simply pushing his closed fist against the perineum. Nevertheless, many surgeons feel that it is necessary to raise the prostate by fingers in the rectum, either the operator's or those of a skilled assistant, in order that improved conditions may be obtained for rapid enucleation of the gland; on one occasion I had the privilege of seeing Dr. Proust assist Professor Tuffier under such circumstances, but such skilled assistance is rarely available.

Messrs. Weiss have made for me a spoon which answers this purpose admirably. The illustration shows its chief mechanical points. The spoon is of the sixteenth-seventeenth century shape, and is 4 cm. across at its widest part: the spoon and its straight handle which are inserted into the rectum are made to imitate the length and the breadth of two long and broad fingers inserted into the rectum. The crank handle is made for the purpose of having the instrument conveniently at hand for manipulation in front of the patient's thigh. The curved processes, one on each side of the handle, are for the purpose of preventing the instrument rolling between the patient's thighs when the surgeon is not using it.

As soon as the bladder is opened the spoon is passed into the rectum and the patient's thighs are approximated; under these conditions it will remain *in situ* and quite out of the way. The surgeon can perform all the necessary manipulations without infecting his hands, and the instrument answers the purpose better, I think, than the fingers of an assistant in the rectum, because the operator acts directly on the spoon: he can push it up or draw it down to the exact position at which he requires the rectal counter-pressure; it can also be tilted to either side so that elevation of any particular area of the base and posterior wall of the bladder can be regulated to a nicety, for every movement of the handle is transmitted directly to the spoon, as it is specially made in one solid piece for that purpose. I have used it in three prostatectomies and in one case of evacuation of blood clots completely filling the bladder. In the latter case the clot was cleared out through a suprapubic wound with great ease and rapidity by means of the spoon in the rectum and suprapubic massage of the abdomen.