to empty the bowel it will be found of service. It may be used with excellent effect in the paralysis of peritonitis, and will, in that difficult case, produce evacuation where other means have failed. As a method of unloading the intestine in chronic obstruction, preparatory to operation, its value also expresses itself.

There is no organ of the body which requires more tender treatment than the bowel, and none which is so often left to be dealt with by the unskilled or uneducated. Many surgeons delegate the use of the enema to an assistant, as if this potent engine were unworthy of their own attention, and many who use it employ undue force. "No force" should be the postulate of our work with the intestine. We cannot be too persuasive, and it is because so much bad practice with regard to the use of the enema is followed, that I have ventured on such an occasion as this to urge my views against the use of the rigid tube, and to plead for one which has both complete safety, and infinite advantage in point of merit. I offer you no weary list of cases because after all they are only useful to substantiate opinion, and if you cannot accept a man's deliberate opinion you are not likely to put faith in his cases. Cases, like figures, can be twisted to prove anything. In such a position as that which, by the kindness of the Fellows, I occupy, a little dogmatism may be excused, and I feel so strongly about this matter of the tube that I have ventured to deal with it in preference to some more brilliant or alluring topic. I beg you to believe that if I speak forcibly it is because I feel conviction, and when I argue for the total abandonment of the older form of tube I desire to assure you that any words I use are spoken with a full recollection of the gravity which my office attaches to them.

Of course the great difficulty to be overcome in acute obstruction is that of diagnosis, and even to the most experienced no finality is possible. There is no branch of surgery in which extended clinical observation and careful reasoning work better together. A simple process of logic will help the most trained clinician to a true conclusion. No cases afford more opportunity for the display of high surgical qualities than those of which I have spoken. Given the proper faculties of observation and deduction, the two qualities which combine to produce great surgical fitness are thoroughness and resource, and in the management of obstruction of the bowel there is the most ample opportunity for their development.

THE TREATMENT OF OBSTRUCTION OF THE BOWEL BY ELECTRICITY.

By JULIUS ALTHAUS, M.D.,

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INTESTINAL obstruction is now generally treated by laparotomy, after purgatives, opium, and belladonna have failed; and there is no doubt that in the case of absolute mechanical occlusion, such as strangulation by bands, etc., the knife affords the only chance for the patient's recovery. Nevertheless, we are bound to admit that the risks of the operation are great, in spite of recent improvements in its *technique*; and for this reason it would appear preferable to resort to electricity rather than to laparotomy in cases where it is conceivable that the obstruction might be overcome by a powerful contraction of the muscular coat of the bowel, that is, in faecal accumulation and intestinal palsy, foreign bodies impacted in the intestine, etc.

In January, 1878, Mr. Allingham requested me to see with him a gentleman, aged 54, who had on the whole been in fair health, but had for the last three months suffered from obstinate constipation, for which purgatives and enemata had been used without much effect. Nothing in the shape of a solid or liquid motion had been passed for fully ten days, when I saw the patient. The abdomen was very much distended and tender; there was total loss of appetite, a degree of collapse, with sunken face, and a small and feeble pulse. Mr. Allingham had the day before introduced a long tube, but without bringing the faeces away; and was anxious that the effects of electricity should be tried, as the patient ap-

peared to be in great danger. I introduced an insulated sound, with free metallic end, into the rectum, and applied a moistened conductor to the abdominal parietes, chiefly in the region of the sigmoid flexure. The primary faradic current was now sent through, and its force gradually increased until the patient experienced a decided feeling of vibration in the bowel. This was done at 10 A.M., and the same evening the patient had a copious motion, with wonderful relief to all symptoms. During the next two days the bowels acted ten times, and in a week the patient appeared to be quite well.

Another case in which I have used faradism successfully was that of a married lady, aged 57, who had nearly all her life suffered from obstinate constipation, which she thought had been brought on "by living on biscuits at school." She had often gone for a week or ten days without relief, but did not appear to be much the worse for it until the time I was called in, when there was great distension and tenderness of the abdomen, bilious vomiting, and prostration after eight days' constipation.

I used the same proceeding as in the previous case at 5.30 P.M. At 1 A.M. she had a good motion, followed presently by two others, when an enormous quantity of faecal matters was discharged, with complete relief.

I regret to be unable to speak about the further progress of these cases, but in both of them life was evidently saved by the application of electricity.

"*Electric Injections.*"—In Paris the continuous current has recently been somewhat extensively used in similar cases, more especially by MM. Boudet and Larat, who have employed it in the form of so-called "electric injections." In order to avoid the escharotic effects of a metallic electrode applied directly to the mucous membrane of the intestines salt water is injected into the rectum, so as to act as a large liquid electrode, the metallic conductor connected with the positive pole of the battery being enclosed in an elastic sound, and thus conducting the electricity to the salt water. It is claimed that by acting in this manner a considerable current strength can be safely used. The circuit is closed by placing a large negative electrode on the abdomen, when the deflection of the needle of the galvanometer indicates the passage of the current. The strength in milliampères must be regulated according to the susceptibility of the patient. In many cases of pseudo-strangulation and faecal obstruction this proceeding, continued from five to twenty minutes, has appeared to give relief. In cases in which a real obstacle has to be overcome, it is recommended to use the current as directed for five or six minutes, and then to reverse its direction, care being taken first to reduce its strength, and get the needle of the galvanometer down to 0, after which the current is gradually put on again to its former power. As soon as the cathode acts in the rectum the bowel contracts, and great desire is felt for defaecation, which the patient, however, is instructed to resist until he finds it impossible to do so any longer. One, two, or three such applications may be required in the twenty-four hours. M. Boudet states that he has been successful with electric injections in 35 out of 50 cases (70 per cent.), while M. Larat claims 101 successes in 230 cases (nearly 44 per cent.). The latter recommends resort to laparotomy at once if the electricity has failed to act in the period just mentioned, and not to lose time by exhibiting purgatives. If electric injections were made soon after the appearance of bad symptoms, and laparotomy followed quickly after failure of electricity, the electrician as well as the surgeon would have a better chance of saving the patient's life than now, when they are often called in too late.

GASTRO-ENTEROSTOMY WITH SENN'S BONE PLATES FOR PYLORIC STENOSIS.

By THOMAS SINCLAIR, M.D., F.R.C.S.ENG.,
Professor of Surgery in Queen's College, Belfast.

THE choice between gastro-enterostomy by lateral anastomosis and the Heinecke-Mikulicz operation of pyloroplasty in cicatricial contraction of the pylorus is one that can only be satisfactorily made when the abdomen is opened. The plan of Loreta of digital divulsion is not likely to be favourably considered when compared with the newer methods

mentioned. In the case detailed below, gastro-enterostomy was preferred on account of the indurated condition of the pylorus. This was judged to be non-malignant at the time; but lest subsequently this estimate should prove to have been erroneous, the operation of gastro-enterostomy appeared the safer course to adopt.

G. W., aged 43, had been a dyspeptic for twenty years, but he did not begin to suffer acutely till twelve months before operation. Previously occasional bilious attacks with vomiting and diarrhoea had occurred. After an attack of sea-sickness, however, frequent gastric pain, relieved by vomiting, became a more constant feature during the next year. The site of the pain was some 3 or 4 inches from the pylorus, showing, as many other cases of gastric ulcer have done, that pain is a most fallacious guide to the situation of an ulcer. Doubtless this was the period of active ulceration, though no hæmatemesis occurred at any time to confirm this opinion. No palpable pyloric tumour could be made out. Increasing weakness and emaciation followed, and the signs of dilatation of the stomach developed rapidly. The organ when distended reached $2\frac{1}{2}$ inches below the umbilicus. Everything in the way of gastric medicines and digestive aids had been employed by Dr. Austin, Dr. Eustace Smith, and other advisers with little effect, including one-tenth grain doses of bichromate of potassium. Washing out the stomach with the siphon tube gave most relief, though this lavage exhausted him much. Nevertheless he steadily lost strength, flesh, and colour, and gave up his employment after losing 3 stones in weight. An operation was determined upon for his relief, upon the assumption that cicatrization of an ulcer was responsible for the dilatation.

On opening the abdomen, gastro-enterostomy was selected in preference to pyloroplasty on account of the hard cartilaginous feel of the pylorus, and Senn's decalcified bone plates were employed. As the visceral wounds were made very ample, the plate sutures were supplemented by a row of Lembert's sutures all round. The stomach was incised about $2\frac{1}{2}$ inches from the greater curvature and about 7 inches from the pylorus. The jejunum was opened about 1 foot from the duodeno-jejunal junction. The intestine was doubled back upon itself, as suggested by Rockwitz, before applying it to the stomach in order to secure correspondence in the direction of the peristaltic waves in the two organs.

The operation was aseptic rather than antiseptic; and the course afterwards was uneventful, neither pulse nor temperature being disturbed. Neither opium nor morphine was given. For three days absolutely nothing by the mouth was permitted. Four nutrient injections were administered each day of the formula recommended by Dr. Knut Hoegh.¹ These injections were well borne, and gave more satisfaction than other forms of nutrient enema that had been used in other cases. On the third day tea, wine and water, and meat juices were allowed by the mouth. By the fifth day soup, beef-tea, and white foods were given; and on the eighth fish and fowl were added. Finally, on the twelfth day ordinary solid food was ordered.

The patient rose on the fifteenth day, and on the seventeenth was exhibited to the members of the North of Ireland Branch of the British Medical Association. A fortnight later he reported himself as feeling well, having gained 2 pounds in weight, and proposed resuming his duties as an engineer to a railway.

PYLORECTOMY FOR SUPPOSED CANCER: PATIENT IN GOOD HEALTH THREE YEARS AFTER OPERATION.²

By T. R. JESSOP, F.R.C.S.,
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SEEING that the patient whose history I am about to narrate is now in the enjoyment of good digestion and excellent general health at the expiration of nearly three years since

¹ *Annals of Surgery*, Part 18: "One ounce of glucose boiled with one drachm of flour and five ounces of water; after this has cooled there is added half an ounce of claret and two eggs beaten up with half an ounce of water."

² Read before the Yorkshire Branch of the British Medical Association at Scarborough, November 7th, 1894.

the removal of her pylorus for new growth, the time has arrived when the facts may be placed on record with the confidence that the charge of hasty publication will not be brought against me. I had once previously performed pylorotomy at the Leeds Infirmary, on a patient whose disease proved to have made more extensive inroads upon both stomach and duodenum than had been divined, or than appeared even on handling the parts when exposed for removal, until too late for the operation to be abandoned, and in whom, therefore, owing chiefly to the prolonged nature of the operation, the shock proved fatal within three days. Since meeting with these two I have not seen another example in which the circumstances seemed favourable for pylorotomy.

Mrs. R., aged 49, first came under observation on November 26th, 1890. She was then complaining of abdominal pain and vomiting, and had lost upwards of 2 stones in weight. It was noted at the time that the stomach stood out in the epigastrium, suggesting retention, and a distinct splashy sound could be elicited. About midway between the ensiform cartilage and the umbilicus, and about 2 inches to the right of the middle line, a hard, irregular nodule could be felt. A diagnosis of pyloric cancer was made. Up to January, 1891, under a rigid dietary and some medicinal treatment, the symptoms seem to have abated. The patient gained a few pounds in weight, and felt better in every way, and the lump in the abdomen could not be found.

In September sickness returned, and gradually increased in severity up to December, 1891. She then looked fairly healthy in face, but was wasted. The abdomen was decidedly thin; the stomach dilated and splashy. A swelling the size of a tangerine orange could be felt at the pyloric end of the stomach.

Satisfied that the disease was malignant, that she was surely losing ground, whilst her strength was by no means exhausted, and that the physical signs in her abdomen indicated an absence of adhesions, I advised her to consider the question of having the pylorus removed. The proposal was favourably entertained by herself and her husband, but before giving their consent they naturally desired to consult the physician upon whose judgment many members of their family had been accustomed to rely. She accordingly went to Glasgow, and there saw Dr. S. Gemmell, who, after a careful examination, wrote to me confirming the diagnosis, and approving the proposed operation.

From December 24th to 28th the stomach was washed out daily, and the patient fed by nutrient enemata and suppositories.

On December 28th, 1891, pylorotomy was performed. An incision $3\frac{1}{2}$ inches long was made in the middle line, starting at the apex of the ensiform cartilage. The stomach at once presented, and the lump at the pylorus was easily found. The stomach and duodenum were secured by means of Hahn's clamps and about $1\frac{1}{2}$ inch of bowel removed. The cut ends of stomach and duodenum were then united by fine silk sutures, the serous surfaces posteriorly being united first, then the mucous membrane all round, and finally the serous surfaces anteriorly. Lembert's sutures were used for the peritoneum. The incision through the stomach wall bled freely, but the vessels were readily seen and ligatured. Once during the operation the patient attempted to vomit, and forced a little fluid through the opening in the stomach. The peritoneum of the median incision was secured separately with fine catgut sutures, and the remaining layers of abdominal wall stitched with silkworm gut. No drain was employed.

The patient vomited once or twice during the afternoon after the operation. The vomit contained a little blood. She was fed by nutrient enemata every three hours. Morphine gr. $\frac{1}{4}$ was injected hypodermically in the evening, after which she slept five hours.

On December 29th, at 6 P.M., the patient commenced to take a drachm of milk with two of water every two hours, by the mouth, but as after the third time she vomited a little, it was discontinued. Morphine gr. $\frac{1}{4}$ was injected for the night.

On December 30th the note made was: Slept five hours; given ice during the night, vomited a little in the morning and two or three times this afternoon; given morphine gr. $\frac{1}{4}$ at night. She passed a good night without vomiting, and on