A surgical study : gastrotomy and gastrostomy / by J.H. Pooley.

A SURGICAL STUDY:

14.

GASTROTOMY AND GASTROSTOMY.

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J. H. POOLEY, M.D.,

PROFESSOR OF SURGERY, STARLING MEDICAL COLLEGE, COLUMBUS, OHIO.

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The stomach may be, and has been, opened by surgeons with two separate and distinct intentions; first, for the removal of foreign bodies which have been swallowed accidentally or intentionally, and which, by their bulk or form, are unable or unlikely to pass through the intestines and be discharged per anum, or got rid of by vomiting, or which give rise to immediately severe symptoms. This operation, and this alone, in strict accordance with its etymology, is called gastrotomy.

Again, in certain cases of inveterate stricture of the œsophagus, whether from cancer, the cicatricial narrowing following the ingestion of scalding or corrosive liquids, or from any other cause, it has been proposed to obviate death and prolong life, or at least promote euthanasia, by making an opening directly into the stomach, and establishing a permanent fistula for the introduction of nourishment. This operation, which has actually been put in practice a number of times, is called gastrostomy, from gastro and stoma, a mouth—stomach mouth; and as one very important office of the mouth is to serve as an entrance or gateway to the stomach, it may be looked upon as bringing the entrance a little nearer, and making it more direct. It is to a study of these two operations, with more especial reference to the latter, that I propose to invite attention in this paper; and as I have no personal or individual experience to offer, and

may justly infer from their rarity that most of my readers have none, we must look for the grounds of our reasoning and conclusions to the recorded literature of the subject. In all departments, and on every subject of medical science, it is the accumulated experience of others, which, fortunately, is the property of all rather than individual experience, which is limited to its possessor, that goes to make the medical man thoroughly furnished for every good work. And it is the possession of both, a carefully accumulated personal experience, as well as a wide acquaintance with professional literature, rather than a blind reliance upon the first, that makes the superiority of the scientifically practical man over the practical man, commonly and improperly so called. Nor can we say that the consideration of this subject is unimportant to any of us; for, however rare the occasion demanding either of these operations may be, they are as likely to occur to us as to any body else, and when they do arise we ought to be ready to act and advise intelligently on the subject.

Disclaiming, therefore, any attempt at originality in this paper, I have endeavored to bring together, in more or less detail, according to circumstances, all the cases on record, and give my own reflections and conclusions thereupon with the greatest brevity.

GASTROTOMY.

And first, of gastrotomy, or opening the stomach for the removal of foreign bodies, Hippocrates says, in his Eighteenth Aphorism (Adams' edition, Vol. II., page 755): "A severe wound of the brain, of the heart, of the diaphragm, of the small intestines, *of the stomach*, and of the liver, is deadly."

But as far as the stomach is concerned, this aphorism of the "Father of Medicine" is not universally and literally true; and as the fact that wounds of the stomach are not necessarily fatal is essential to the very consideration of a

surgical procedure which consists in inflicting a wound upon it, we have thought it worth while to dwell for a moment upon this point as preliminary to our main subject. Hundreds of cases of recovery from wound of the stomach could no doubt be produced from the literature of medicine, but we will only adduce one or two, and these from the older records of science, for the double purpose of showing that such wounds may be recovered from under what we should now-a-days call very bad treatment, and that the knowledge of their not being invariably and absolutely fatal is not recent, but old and well established.

The two following cases are taken from Turner's Surgery, published in 1736, and quoted from sources much older: "In the month of January, 1632, being in the Gulf of Venice, Richard Partridge was wounded by George Farmer under the left hypochondrium, both being quartermasters of the ship Hector, whereof Mr. Wilde was commander. What he received into his stomach issuing out by the wound, which, through the great mercy of God, was, notwithstanding, made whole in twenty-four days. The treatment, which it is unnecessary to detail, consisting of the application of various so-called mundifying and incarnating remedies, applied according to the old doctrines of surgery, together with rest and a rigid control of his diet."

James Oethius, in his Physical Observations, records such another: "In the Province," saith he, "of Fulda, I was familiarly acquainted with two industrious surgeons, David and John Schenck, who constantly affirmed to me that they had formerly cured a robust soldier who, by a rustic of Marpach, in the same Province, was, with a hunting-staff, struck through the right hypochondrium, and after they had diligently searched the wound, they perceived it had penetrated into the ventricle (stomach), and the meat and drink he had taken a little time before, to gush forth altogether thereat. Whereupon, declaring to the sick man and his

kindred the greatness of the danger, they essay the cure, and penetrating that part of the ventricle that was wounded to the wound of the muscles of the abdomen, and there, with one suture, fastened together the gaping ventricle and the said wound in the muscles; the patient enduring this dolorous kind of cure. At last the wound, little by little, was consolidated, the sick man recovering his former health and strength."

Leaving these cases of accidental gastrotomy, we will now notice in detail those instances where the stomach has been intentionally opened for the removal of foreign bodies. There are two tables of these cases, one in an article on "Foreign Bodies in the Stomach and Intestines," by Alfred Poland, (Guy's Hospital Reports, Third Series, Vol. IX., containing six cases); and the other in the second edition of Holmes' Surgery, Vol. II., page 559, in the article on "Wounds of the Neck," by Arthur E. Durham, which contains seven cases.

Of these cases the first five are the same in the two tables; the sixth case, in Poland's table, he regards as questionable, being merely the record from the Abridgement of the Philosophical Transactions of the Existence in the Museum of Anatomy Hall at Leyden of a knife, ten inches in length, removed from the stomach of a man who lived eight years after; and he supposes it may refer to the same case which he makes first in his table, which I shall make first in mine, and the detailed history of which will be given further on. But inasmuch as the size of the knife given is not the same in the two accounts, being said to be ten fingers' breadth long in one case, and ten inches in the other, and as the knife removed in the first case is said to be in the library of the Elector of Kœnigsburg, and the second at Leyden, I shall regard them as two distinct cases. To these I have been able to add only three others, making a table of only eleven cases in all, the most complete so far collected.

I shall first give the details of some of these cases, and

TABLE OF CASES IN WHICH THE OPERATION OF GASTROTOMY HAS BEEN PERFORMED FOR THE REMOVAL OF FOREIGN BODIES.

No.	Date.	Sex.	Age.	Nature of foreign body.	Mode of operation.	After-treatment.	Result.	Operator, authority, remarks, etc.
1	1613	Male	Adult	Small knife	Unknown	Unknown	Survived 10 years.	Gruger, a Polish surgeon; Gross' Surg., 4th ed., vol. ii., p. 611.
2	1635	Male.	.....	Knife, 6½ in. long..	Straight incision in left hypochondrium	Tents impregnated with balsam, etc.	Wound healed on 14th day	Shoval; Chelius Surg.; translated by South; vol. ii., p. 391.
3	1743	Fem.	.....	Knife	Incision on knife, which could be felt	.....	Rapid recovery ...	Hubner, Memoirs de l'Academie Royal, 1743.
4	.....	.....	.....	Knife-blade, 2 in...	.....	.....	Recovery	Prof. Frizac, of Toulouse; Gross' 4th ed., voll. ii., p. 611.
5	.....	Male.	.....	Knife, 9 in. long ..	.....	.....	Rapid recovery ...	Florian Mathis; quoted by Sedilot.
6	.....	.....	.....	Knife, 10 in. long .	Incision in left hypochondrium.....	Sutures, pledgets of balsam, etc.	Very rapid recov'y	Schwaben; misquoted Swaben by Poland.
7	1819	Fem.	.....	Silver fork.....	Incision through left rectus muscle.....	Poultices, etc.....	Rapid recovery ...	Cayroche; quoted by Sedilot.
8	1823	Male.	.....	Silver teaspoon...	Swelling cut down upon.....	.....	Rapid recovery ...	Operator unknown; quoted by Sedillot.
9	1854	Male.	32....	Bar of lead weighing 1 pound.....	Longitudinal incision	Wound closed by sutures	Rapid recovery ...	Dr. Bell, Walpello, Iowa; Boston Jour., vol. lxi., p. 489.
10	.....	Male.	.....	Knife.....	.....	.....	Recovery	Quoted by Poland; Guy's Hospital Reports.
11	1856	.....	.....	Catheter	.....	.....	Death.....	Gluck in America; Gunther Blutige, operationen am Menschich en Korper.

then proceed to point out the facts which they bring to light, and discuss finally the propriety of the operation, the indications for its performance, and the mode of executing it. The first case I give is the celebrated one of Schwabius or Schwaben, quoting again from "Art of Surgery," by Daniel Turner, London, 1736, Vol. II., page 457, who himself quotes the account from one Dr. Becker.

"In the year 1635, the 20th of May, stylo novo, a rustic young man, by name Andrew Grünherd, in the morning, feeling in his ventricle (stomach), by reason of some ill diet heretofore weakened, a kind of disposition to vomit; and, as he was wont, endeavored to procure it himself with the haft of his knife, provoked the gorge; and vomit not presently coming, did thrust in his knife a little deeper, which, partly by violence and partly by its own weight, so let down, and comprehended within the jaws, escaped the extremities of his fingers, and by little and little tended to the ventricle and stopped somewhat about the orifice, not without pain aud dolour.

"But although the swallow-knife being somewhat terrified, and by bowing his body downwards essayed the egress of the knife, yet it was all in vain; therefore, upon new advice, Laudibergensis endeavored rather the more to humect the mouth of the stomach with beer or ale, and so to promote the knife to the cavity of the ventricle; and which succeeded, and the knife went down to the bottom thereof. And so the anguish and pain aforesaid ceasing, the countryman, though not a little troubled with his unwelcome guest, yet went he about his accustomed labors without trouble. The knife, as after excision it was seen, was just in length ten fingers in breadth. This, the most miserable condition of the rustic, moved the consul, Master Hartlein, to implore my counsel, to whom I gave this answer, that it was a matter of great moment, and that scarcely two such chances* were to

* Cases.

be found in the observations of physicians; and having declared the story of the Pragensian swallow-knife, I advised that the man should be sent for, that, by the whole college of physicians, deliberation might be had what were best to be done. Afterwards the case is laid open to the famous Mr. Crager, a prime colleague, and the patient readily submitting himself, the 25th of June, seven and twenty days after it had been swallowed, was appointed for a general meeting, when, examining all things, it was concluded his body should be prepared for the section by giving him some balsamic medicines, especially the Spanish balsam, so called, and recommended by the senior physician, Dr. Lothus, together with the magnetic plaster, after the example of the Pragensian cure. This, saith our author, I received from a very credible Spanish priest, who told me that in Spain it was not lawful to compound it, because men, trusting to its wonderful efficacy, made nothing to enter the lists and fight, for it healeth the wound in twenty-four hours. The body being prepared, and all things necessary provided, at length, on the 9th of July, one and forty days after the accident, there met the dean of the faculty, with the honorable members, together with the students, masters of arts, in company with that most experienced chirurgeon, Daniel Scwabius, now in Heaven, who, calling upon the divine assistance and benediction, the rustic, who, with undaunted courage, waited the section, was bound down on a table, and, the place being marked out, the incision was made towards the left side of the hypochondrium, some two fingers' breadth under the short ribs, according to the direction, and first the skin and fleshy pannicle (there being no fat seen), with the subjected muscles, as also the peritoneum, were carefully divided, when, although the ventricle did somewhat sink down, and avoiding our fingers, did so presently admit of apprehension, a little staying the operation, yet at length attracted with a needle crooked, it showed that the knife was there, which

being laid hold on through the coats of the ventricle, and the point brought upwards, the said ventricle above the same was incised, and the knife successfully extracted, which was viewed by all the by-standers, applauded by all, and none more than the patient himself, who professed that this was the very knife he formerly swallowed. But the wound itself, after the knife was drawn forth, was quickly allayed. The knife being thus successfully brought forth, and the patient eased of his bands, the wound cleaned of the blood, and the abdomen that had been incised closed together with five sutures, by their interstices, the balsam was instilled warm, and dossils therewith impregnated laid on, and then a cataplasm of bole, white of eggs, and alum, to allay all inflammation on the outside. About five in the evening he took this sequent decoction with a portion of the sequent powder."

Here follow some very complicated prescriptions, which I omit, as also the laborious daily record, and quote only the end of the narrative, as follows:

"And thus," saith our author, "by the grace and clemency of the Omnipotent Jehovah and Supreme Director, and with the singular industry and dexterity of the physicans and surgeons, our rustic swallow-knife was restored to good health, complaining of no dolour of his ventricle; but, being returned to his accustomed diet and ordinary calling, with us gives thanks to the immortal God; to whom, therefore, be the glory, praise, and honor for ever and ever. Amen."

A young fellow of Prague (probably the one referred to in the preceding narrative as the Pragensian swallow-knife), out of mere sport, says Crollius, swallowed a knife nine inches long, the point of which presented a little above the fundus of the stomach, towards its left side, and the handle towards the spine. Two months afterwards it was successfully extracted from the stomach by Florian Mathis, first surgeon to the emperor. Recovery took place with scarcely any symptoms.

In 1635 Shoval had an uncle who had swallowed a knife six and a half inches long, and had retained it about six weeks. A straight incision was made through the left hypochondrium two fingers' breadth under the false ribs, the knife was removed, and the wound joined together by five sutures. Tents, impregnated with tepid balsam, and a cataplasm of bolar earth, white of eggs, and alum applied. The wound healed on the fourteenth day after the operation. (Chelius's Surgery, translated by South.)

A Prussian woman had the misfortune to swallow a knife seven inches long, which she had introduced into her throat to excite vomiting. At first it stuck in the œsophagus, but afterwards descended into the stomach, where it remained three days without causing any pain. She afterwards felt pricking sensations, and very soon the point of the knife could be felt on the left side. The pains increasing, forced her to seek advice. Dr. Hubner, of Rastembourg, to whom she applied, made an incision over the point of the knife, in the left hypochondrium, on the eleventh day of the accident. He found that the blade had already passed through the stomach. The knife was extracted, and prompt recovery followed.

The next case is that of a lady at Bourdeaux, aged twenty-four. A small silver fork slipped into the throat and descended into the stomach. Here it remained some months, hardly producing any symptoms; but at the end of this period the most violent vomiting came on, and soon brought the patient into a most dangerous condition. By the advice of MM. Delpech and Fages gastrotomy was performed by M. Cayroch; the fork was easily extracted, and within twenty days the wound completely healed. (Report de l'Acdad. Royal de Medicine, Bourdeaux.)

A man had swallowed a silver teaspoon, and at the end of some months it could be felt, as a tumor, through the abdominal walls. The swelling was cut down upon, and something

metallic felt; the opening into the stomach was enlarged by the bistoury, and the spoon extracted. The wound healed rapidly, and the patient made a speedy recovery. He confessed that he had stolen the spoon, and swallowed it for the purpose of concealment. The name of the operator is not given. The case is quoted from Sédillot, in Holmes's Surgery, 2d edition, Vol. II., page 550.

In 1854 a man in Iowa, in performing some tricks of legerdemain, allowed a bar of lead two inches long by upwards of six lines in diameter, and weighing one pound, to fall into the stomach. Dr. Belle, of Walpello, removed the bar of lead by making an incision four inches in length from the umbilicus to the false ribs, some distance to the left of the median line. The opening made into the stomach was just large enough to admit of the passage of the bar, and required no sutures, as it became immediately closed by the contraction of the muscular fibres of the organ. The external wound was stitched in the usual manner. No untoward symptoms occurred, and the man recovered in less than a fortnight. (See Gross's Surgery, Vol. II., page 610.)

The following case is taken from "Günther Blutige Operationen am Menschlichen Körper, Vierte Abtheilung, p. 27," and is rather unsatisfactory from its brevity and want of references. It is given almost literally, just as it stands, being the sixth and last case to which he refers in his list of cases of this operation. ("6") "Glück in America, 1856: a catheter, which was about to be used for injection into the trachea, passed through the œsophagus into the stomach; gastrotomy; death." This, as far as I know, is the only fatal case on record. The last two cases are the only ones I have been able to find in which this operation has been performed in this country.

The first thing that strikes one upon a review of the eleven cases thus brought together, is the astonishing fact that out of the whole number only one death is recorded—a result

which, I venture to say, no one previous to entering upon the study of the subject would have been prepared to expect, and which, as we shall presently see, is of importance to the just estimation of the analogous operation we have soon to consider. As to the propriety of gastrotomy for the removal of foreign bodies in cases which demand it, there is a tolerable unanimity of opinion among those who mention it at all in its favor. The cases which call for it must always be rare, and largely confined to lunatics, drunkards, and so-called jugglers, though we have on our table three cases where foreign bodies slipped into the stomach while being thrust far back in the fauces for the purpose of provoking vomiting, one where a spoon was swallowed for concealment, and one where a catheter was lost in the stomach during a surgical procedure. The history of foreign bodies in the stomach is a very curious chapter, the most astonishing substances, and the most astonishing numbers of them, even to the extent of several pounds in weight, having been introduced into this organ with at least temporary impunity; but as they almost always lead ultimately, if of large size, to severe suffering and death, and as they may be removed, as our table shows, with a fair prospect of success, we can by no means agree with Mr. Poland, who, in an interesting article on "Foreign Bodies in the Stomach," etc., in "Guy's Hospital Reports," 3d series, Vol. IX., p. 309, says: "On the whole, it appears that at present we can not consistently recommend the operation." A most unwarranted conclusion, it seems to me; for a review of the whole subject clearly shows that, as far as the evidence goes, the danger from operation is less than from the prolonged sojourn of large foreign bodies in the stomach or intestines. For of thirty-two cases of all kinds collected by Mr. Poland twelve died, or more than one-third, and in most of those who recovered the foreign body was small or otherwise innocuous, whereas we have seen that only one out of eleven died of the opera-

tion; and with regard to that one case our information is most meagre and unsatisfactory—hardly sufficient to justify an inference of any kind.

Our own conclusion, therefore, is, that when there is sufficient evidence of a body so large as to make it improbable that it can pass through the intestines without danger, being lodged in the stomach, or when there is much pain or distress, the operation is called for, and should be performed. We have said, when there is *sufficient evidence*, advisedly, for as a certain proportion of these accidents occur in insane or drunken persons, this point may be the most difficult part of the whole case. An important indication may be afforded by the presence of a hard body perceptible externally in the epigastrium, and this should always be sought for. As to the mode of operation, little need be said here, as the main points will come up for discussion in our next section. In all the cases of gastrotomy for the removal of foreign bodies, where the mode of operation is described, it has been by a straight incision in the left hypochondrium two or three inches from the median line, and extending from the cartilages of the false ribs downward three or four inches along the left linea semilunaris, exposing the edge of the rectus muscle. And as none of the cases have presented any operative difficulty of importance, there would seem to be no reason for innovation in this respect. I would only suggest, from experimental trial on the cadaver, that the incision be somewhat nearer the median line, and commenced higher up toward the arch of the diaphragm. Any vessel that bleeds should be secured as soon as cut, and should the rectus muscle be found in the way, it should be drawn aside rather than cut, if possible. It has been proposed by many authors, even so far back as old Turner, that the stomach be distended with fluid before the operation, so as to be more really brought into view; but I do not think this is to be recommended, as the presence of a foreign body large enough to justify the

operation would be guide enough, and the danger of the fluid passing into the peritoneal cavity, and in these days of anæsthetics the danger of its producing embarrassment by exciting efforts to vomit would more than overbalance any problematical advantage it might possess. It has never been done. It has also been proposed to open the stomach with a grooved trocar, which would serve as a director for enlarging the opening. This seems to be one of those expedients that belong rather to the closet than the operating table; I can see no possible benefit from it, and no one has ever thought it worth while to try it. After the incision has been carried carefully through the peritoneum, the finger will easily detect the left or thin edge of the liver, and just above and beside it the stomach, and probably through its coats the foreign body. The stomach may then be seized with a pair of hooked or toothed forceps, which would be better than a hook, as requiring less space for their manipulation, and brought to the external opening and the foreign body extracted through as small an incision as possible. In most cases probably there will be no need of closing the stomach wound, as it will close itself, as in Dr. Bell's case; but should it not, a fine uninterrupted suture (gastroraphy) may be used. No directions are needed for the care of the external wound, which will be treated on general principles, modified by the individual preferences of the operator. Of course the patient should be rigidly confined to bed, and his diet restrained for a week or two after the operation. Severe vomiting would be most to be dreaded of any symptom that could supervene; and I would suggest, in addition to any means used to control it, firm compression with a bandage. Pain must be met by the hypodermic use of morphine.

GASTROSTOMY.

We come now to the second and most difficult portion of our subject, viz., that of opening the stomach for the pur-

pose of establishing a permanent fistula for the introduction of food in case of complete closure of the œsophagus — an operation first performed by Sédillot, of Strasbourg, in 1849, who gave it the name of gastro stomie, or stomach mouth, a term which, modified into gastrostomy, we propose to retain as worthy to become a recognized surgical technicality.

That the idea of introducing food directly into the stomach through an artificial opening in those terrible cases of death from starvation, where there is complete obstruction of the œsophagus, should have suggested itself to surgeons, can not be wondered at; it was only what we might have expected from their humanity and enterprise. Since the first trial by Sédillot the operation has been repeatedly performed, but hitherto without success. Is this want of success inherent in the operation and unavoidable, and should it, therefore, be abandoned? Or has it depended upon avoidable circumstances in the cases operated upon, and does it, therefore, demand further trial under more favorable circumstances? These questions we shall seek to answer by a study of this operation, conducted in the same way as in gastrotomy for the removal of foreign bodies.

As in the first section we deemed it proper to show, as a preliminary, that wounds of the stomach are not necessarily fatal, so here we will first settle the fact that the continuance of human life is compatible with the existence of a gastric fistula, disregarding for the present the well-known fact of the tolerance of fistulæ of this kind in the lower animals, to make use of it further on.

And here, fortunately, our material is prepared for us—ready to our hand. In an excellent and very interesting paper by Dr. Charles Murchison, in vol. xli. of the Medico-Chirurgical Transactions, there is a table of twenty-five cases of gastric fistula, in most of which life was prolonged for a considerable period, in some for many years; in one,

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Among Dr. Murchison's concluding remarks are the following: "It is astonishing to observe how little influence the existence of gastro-cutaneous fistula has upon the general health. In most of the cases resulting from wound or simple ulcer, the patients are stated to have enjoyed excellent health. This was particularly remarkable in Wencher's case of a woman who lived for twenty-seven years, following her ordinary vocation; and is still more so in the case of Alexis St. Martin. In Catherine Ross (the Doctor's own case, who was still living at the date of the article, having had the fistula over four years,) "the state of general debility is more to be attributed to a general derangement of the entire nervous system than to the effects of the fistula." Having thus shown in brief that the existence of a gastric fistula is not in itself inimical to life, we will proceed as before; first, to notice some of the cases of gastrostomy in detail, and then discuss the propriety of the operation, the indications for its performance, and the mode of executing it.

I have collected eighteen cases,* which is believed to include all on record up to the present time; the largest previous table, containing nine cases, is by Mr. Durham, in the second edition of Holmes' Surgery, Vol. II., p. 546. Let us now examine briefly the history of some of these cases.

Sédillot's first case was a man aged fifty-two, with epithelial cancer of the œsophagus; symptoms of obstruction had existed for five months, and were rapidly increasing in severity;

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* Two of these cases have been derived from a recent article of Dr. Jacobi's on the subject in the *New York Medical Journal*, published since this paper was first written, viz., in August and September, 1874. The cases thus acquired are the Doctor's own case and one of Von Thaden. The three last cases have come to my notice since the publication of Dr. Jacobi's paper.

great debility; absolute inability to swallow; passage of bougie impossible. Frictions, local applications, and nutritive enemata had been used. The operation, undertaken at this stage of hopeless exhaustion, is described as follows: Chloroform was administered (this is forbidden by several authors) and a crucial incision was made through the skin over the top of the rectus muscle. Sheath and muscle similarly cut through and peritoneum divided; great omentum exposed; by drawing this downward the stomach was brought into view and the greater curvature drawn up to the wound; anterior wall punctured midway between the cardiac and pyloric end.

A canula was introduced so made as to hold the stomach in contact with the abdominal parietes, and closed with a plug. Warm fomentations were applied over the abdomen. Eau sucrée and beef-tea injections from time to time; greenish bile accumulated in the stomach and escaped when the plug was withdrawn from the canula. There was no pain, the patient slept at intervals and was comfortable during the night; in the morning dyspnœa and quickness of breathing came on, followed by rapid death fifteen hours after the operation. Post mortem revealed only slight and equivocal signs of peritonitis.

Sédillot's second case was also one of malignant disease of the œsophagus, where excessive dysphagia had existed for nine months. A long incision was made on the left side, two fingers' breadth from the median line and two centimetres below the false ribs; and a second incision perpendicular to this, so as to make a cruciform incision.

The stomach was seized and fixed to the abdominal walls by five or six points of suture carried through its peritoneal and muscular coats only; opening the stomach being postponed till it was attached to the parietes. Chloroform was administered. Two hours and a quarter after the operation the stomach was partially torn from its connections by a fit

of coughing and passed into the abdomen; it was drawn out again and fixed to the skin by Assalini's forceps.

The part thus included became gangrenous, and when removed five days after the operation the stomach was opened into. The surrounding adhesions were then firm. Through the fistulous opening wine, beef-tea, milk, etc., were introduced, but they would not remain in the stomach. The patient died ten days after the operation of exhaustion and peritonitis.

As Sédillot was the pioneer of this operation, so Cooper Forster, of Guy's Hospital, was the first to perform it in Great Britain, having no previous knowledge of Sédillot's cases. We now proceed to consider Forster's cases, which were also two in number. His first case was for malignant disease in a man aged forty-seven. He operated without chloroform, for fear it might produce vomiting, and by an incision two and a half inches to the left of the median line, commencing an inch or more below the cartilages of the false ribs and extending downwards about three inches. The orifice in the stomach was left about large enough to admit the little finger. Milk, eggs, and rum, in small quantities, were administered every half hour through an elastic tube passed into the stomach through the wound, with great relief to the patient, who died, however, of exhaustion, forty-four hours after the operation.

Mr. Forster's next case, one of the most important and instructive on record, is as follows: James G., aged four years and four months, was admitted to Guy's Hospital February 2, 1859, under Dr. Addison's care, in an extremely thin and emaciated condition. Seventeen weeks before admission the child swallowed some corrosive poison, supposed to be a solution of potash or caustic alkali, used for bleaching and cleansing linen. This accident was followed by the usual symptoms of pains and inflammation, and consecutively by a stricture of the œsophagus, which had been progressively

increasing up to the date of his admission. He then complained of pain in the throat and epigastric region. He swallowed a quantity of beef tea two days before his admission, but has taken nothing since, though he does his best to get down something and overcome an obstruction which evidently exists. There is nothing to be seen on looking into the throat. Various futile attempts were made to relieve his sufferihgs until the 13th of February, eleven days after his admission, when Mr. Forster, who had been desirous of doing so sooner, operated in the following manner: Chloroform was administered, and an incision made, about two inches in length, along the outer edge of the rectus muscle in the left hypochondriac region, commencing at the cartilages and opposite the space between the seventh and eighth ribs. The muscles and fasciæ were cautiously cut through, and several vessels tied, which bled very freely; the peritoneum was then exposed and carefully divided on a director; coils of small intestines immediately appeared in the wound, but were held on one side while two fingers were passed up to the diaphragm to find the œsophageal end of the stomach. This part of the operation was attended with some difficulty. When, however, the stomach was reached, it was easily recognized by its thickened appearance and velvety feel; also the greater curvature being the part exposed, the vessels passing along it, as also the descending portion of the great omentum, rendered it certain that the viscus now in view was the stomach. An opening was immediately made into it, but a large vessel that was divided required ligature at the two ends, as they bled profusely; the edges were then stitched carefully to the abdominal parietes by an uninterrupted suture, and the rest of the wound in the abdomen closed by similar means.

After the operation he was fed through a tube every hour, night and day, unless he was sleeping, and seemed to be much relieved by what had been done for him.

The operation was done on Sunday, and he went on very comfortably till Wednesday. On Wednesday morning, early, he was very comfortable and was being fed every hour and a half through the tube, which he seemed to enjoy; nay, he even asked for his poultice (as he called it) when the time arrived for the nourishment to be administered. About 10 o'clock A.M., after having been fed, he suddenly complained of great pain over the abdomen. He became collapsed, cold, the eyes sunken, pulse almost imperceptible, quickly sunk into a comatose state, and at 2 P.M. he died. At the post-mortem it was found that some of the sutures had given way, and general peritonitis had ensued. Scarcely any adhesions had formed between the stomach and parietes. Other details I omit.

I shall not burden this paper with any further details of these cases, particularly as a résumé of all of them has recently been published by Dr. Jacobi, of New York, in the "New York Medical Journal," for August and September, 1874. Suffice it to say, that they all died, the average duration of life after the operation being a little over three days; the longest period being thirteen days, the shortest fourteen hours. Ten died of exhaustion. In only two cases were there marked evidences of peritonitis, and both of these were cases where the sutures at the junction of the stomach with the integument had given way; and the one who lived thirteen days died of broncho pneumonia. In thirteen of the cases the stricture was from malignant disease; in one, from the effects of a corrosive poison, and in one from syphilis.

Having seen that wounds of the stomach, however rudely inflicted, are not necessarily fatal; that gastrotomy, for the removal of foreign bodies, gives only one death in eleven cases; that human life has been prolonged in comfort for many years with a gastric fistula in numerous cases, and knowing well that the lower animals seem to endure such a condition with absolute impunity, the results of this table

must be pronounced, at first sight, quite unexpected and inexplicable. It seems clear to me that the explanation is to be found solely in the debilitated condition, in many cases the almost dying condition, of the patients operated upon. In no one case does it appear that the operation shortened life; while in several it undoubtedly prolonged it, and in all it mitigated the truly horrible suffering from hunger and thirst.

It is a significant fact that every one who has operated seems to have been convinced more firmly afterwards than before of the propriety of so doing; only one regret being expressed, viz., that it was not done earlier.

Mr. Bryant says: "In my own case the man lived five days; the operation had nothing to do with the death, and the local repair was most complete. The operation has not hitherto been successful, I believe, because it has been put off until too late a period; in the same way as colotomy was unsuccessful, until it was undertaken at an earlier stage of the disease. Let gastrotomy have the same chance as colotomy has now had, and it will become as established an operation in surgery."

These words of Bryant express, in my own opinion, the legitimate conclusion to be derived from an impartial survey of the subject. The operation is not yet to be abandoned, but surgeons must have the courage to propose, and, when patients will submit, perform it earlier, before the vital powers are so far exhausted as to forbid the hope of rallying, and when the patient does not die at all from the operation, but simply because relief comes too late.

Such opportunities will be infrequent, as it is hard to overcome the vis inertia even of surgeons in the face of so much discouragement, and in cases where so little can be promised, either to their emolument or reputation, and patients will always be too ready to court delay, even to their own destruction. Nevertheless, we must insist that the operation ought

to be still further tried, under more favorable circumstances, and by the results thus obtained let it stand or fall.

Of course, in the majority of cases, it is only a palliative at best, and for this reason some insist that it is utterly unjustifiable, and say that it is at best but a refinement of cruelty. Such objections are best answered by translating into plain English the logic which they imply, which is simply this: If people must die soon, the sooner the better.

Though fully convinced that the operation is a proper and justifiable one, it is not so easy a matter as might be supposed to point out the exact indications for its performance. Much, almost all, must here be left to individual judgment. But we may lay it down as a general or approximative rule, that when it is clear that the stricture, whatever its nature, is of a progressive character, and has reached the point of seriously interfering with the patient's nutrition, then operate. A very embarrassing fact presents itself in the history of many cases of œsophageal stricture, which is, that after deglutition has been almost or quite impossible for several days, and dissolution seems imminent, all at once, and without obvious cause, an amelioration takes place, the patient again swallows some nourishment, and for a time improves, and even in some cases has lived for a long time. Now, say some, if you operate, except in the extremest cases, how do you know that such a spontaneous amelioration might not have taken place if you had waited? I answer, we don't know, and we don't want to know; such occurrances are too rare and exceptional to form a proper guide for the action of reasonable men, and such a balancing of *possibilities* rather than *probabilities* would paralyze all human effort. Besides, it remains to be seen whether, under proper circumstances, gastrostomy is such a dangerous operation as to demand this extreme caution.

To return for a moment to the causes demanding this operation and their influences upon its result. As we have

seen, sixteen of the eighteen cases recorded were for cancerous disease, and of these ten are described as epithelial, a form of malignant disease which is the slowest of all to affect the general system, and which, unless it involves some organ essential to life, admits sometimes of almost indefinite prolongation of existence; here we are reduced to the miserable alternative of watching the horrible sufferings and death of a patient, not directly from the disease, but from sheer starvation, with the certainty that, could nourishment be supplied, life, for a considerable time at least, is still possible.

At the same time, as the efforts to swallow become more difficult and painful, they become also more irritating and aggravating to the disease that makes them necessary, and constantly increase it; while, on the other hand, could a gastric fistula be safely established, there is no doubt that in many instances the rest afforded to the œsophagus would enable it, after a time, to resume to some extent its functions.

In a case of syphilitic stricture, the respite obtained by the operation might give time for a complete cure to result; while in the case of a stricture from the results of corrosive poison, most likely to occur in a child, though if complete very little hope of the restoration of the canal could be entertained, almost any thing would seem better than to see the miserable little sufferer die of starvation, and it might be possible to prolong life for many years.

In this connection, there is one very curious fact that deserves a passing mention. Bardeleben found that though life was easily maintained in dogs that simply had a gastric fistule, but took food in the natural way, that in a dog in which he had obliterated the œsophagus, after the successful establishment of such a fistula, he was unable, with all possible care, to prolong life more than a year. This observation being a solitary one, is therefore of little practical value, but curious and interesting.

It only remains, in conclusion, to speak of the operation

itself. Sédillot, its originator, made use of a crucial incision, in which he has been followed by only one other operator, Mr. Lowe, of the Norfolk and Lynn Hospital. I can not see any advantages to be derived from this form of incision, and as it has obvious disadvantages, it may be dismissed with this bare notice. One surgeon, Fenger, of Copenhagen, is said to have operated by a transverse incision; but I have not been able to obtain access to the particulars of his case, and should think this method quite as objectionable as the last. *Eight of the operators have made a straight vertical incision along the left linea semilunaris, from the cartilages of the lower ribs more or less high up, according to fancy, and extending downward the necessary distance, say three or four inches; and this is the method described in Maunder's Operative Surgery, London, 1870, under the strange, awkward and barbarous term of *gastro-stomachotomy!*

Notwithstanding the general preference that has been given to it, I do not think this method the best.

Several of the operators speak of considerable difficulty in reaching the stomach through this incision; and in the instances in which I have had the opportunity of trying it on the dead body, I have found it very inconvenient indeed. It must be borne in mind that an incision that would answer very well in gastrotomy for the removal of foreign bodies, would by no means necessarily be as commodious in this case. In addition to not having a foreign body to guide us by its bulk and hardness, we have to search for an empty and contracted stomach in an emaciated subject, where it is drawn far up under the arch of the diaphragm; and furthermore, we need here an incision that will enable up to attach the stomach to the parietes with the least possible stretching.

In point of fact, this tension on the sutures seems to have been the main cause of the fatal result in both Sédillot's and

* In three cases the mode of operating is not mentioned.

Cooper Forster's second cases, and is very plainly seen in the diagram of the appearances after death in the latter gentleman's first case, published in the Guy's Hospital Reports.

This tension is liable to be aggravated by an unnecessary anxiety which surgeons have exhibited to open the stomach as near the cardiac extremity as possible. This may be theoretically of some importance, but it is certainly more so not to put the organ on the stretch any more than is unavoidable; and the rule undoubtedly is to open the stomach at that point which will give rise to the least tension or dragging. Taking every thing into consideration, I believe an oblique incision along the cartilages of the ribs, and extending pretty high up toward the xyphoid cartilage, as practiced by Bryant, and more particularly described by Maury, the first American operator, to be the best.

Dr. Maury describes his incision as follows: "A curvilinear incision, the convexity of which presented toward the median line, was commenced at the sternal extremity of the seventh intercostal space, and carried downwards and outwards for nearly four inches, exposing the sheath of the rectus muscle." Whatever form of preliminary incision is practiced, the dissection is carried slowly downwards, as in all similar operations, layer after layer being divided upon a director until the peritoneal cavity is opened. When the stomach is distinctly made out, its anterior wall is to be transfixed at the most convenient spot that offers by two ligatures with a needle at each end, passed in about an inch apart, and an opening being then made between, they serve to fix the coats of the stomach to the abdominal wall. Owing to the danger of stitches tearing out, it is perhaps advisable to introduce a short, broad canula, with wide, projecting shoulders or flanges. For the first few days after the operation it is advisable to forbear putting food into the stomach, but the patient may be sustained by nutritious enemata, while time is given for some degree of consolidation to take

place between the stomach and the abdominal parietes. All medicine should be administered hypodermically.

When food is first introduced into the stomach it should be in small quantities, and in a fluid and easily assimilable form—such as milk, beef tea, eggs, etc., with or without some form of alcoholic addition, as the case may demand.