country quack, who suggested the application of a puff-ball. The surgeon who attended her states:

From the day the patient commenced the use of this substance her sufferings were greatly mitigated, and she improved in health and strength. The frequent bleedings ceased, and the foul odour from the sore was greatly diminished; indeed, so admirably did the puff-ball act, that the poor woman lived in comparative comfort for seventeen years after the first appearance of the cancerous ulceration.

"Mr. Fagan of Belfast," he mentions, in giving further evidence of the value of puff-ball, told him "that when removing a large tumour from the neighbourhood of the orbit, he encountered the most violent haemorrhage from large arteries in the bone, which of course he could not tie, and which even pegging with pieces of wool failed to control, yet a small piece of puff-ball at once restrained all bleeding."⁹

In a case of alarming haemorrhage after miscarriage Dr. Duncan¹⁰ of Tyrone introduced half of a puff-ball into the vagina and arrested the bleeding, when ergot and plugging the vagina in another way had failed.

Two cases of profuse bleeding from the nose were treated successfully in America with pieces of puff-ball inserted as plugs in the nostrils by Dr. Hall,¹¹ who wrote:

As a haemostatic for controlling the severer forms of epistaxis, I believe it has no equal. I have such confidence in it for this purpose that I am now never without it. I believe that no valid objections can be raised against its use on the ground that it is not sufficiently aseptic, while, on the contrary, it is to be preferred to many haemostatics on account of its non-irritating qualities.

If we compare these observations with those made before in the eighteenth century we find them much alike in their favourable estimate of the fungus as a styptic. I have seen troublesome bleeding after the extraction of a tooth readily stopped by a bit of puff-ball thrust into the empty socket when other styptics had been applied with no good result. If the plug is swallowed accidentally it can do no harm, as the fungus is quite innocuous when eaten. Heating the puff-ball in an oven to render the dressing aseptic does not appear to impair its haemostatic properties. One objection may be raised to its application to wounds of the face—that an ugly brownish stain is often left, but this usually soon disappears.

In times when more often than not excessive haemorrhage was checked with burning irons, boiling oil and tar, and powerful escharotics, the application in their place of soft non-irritating fungi must have been greatly appreciated by patients who were wont to suffer much under the hands of surgeons.

REFERENCES.

- ¹ Dioscorides, *Materia Medica* (Sprengel's edition), Liber iii, cap. 1.
- ² Buchan, *Domestic Medicine*, 1789, p. 638. ³ *Dictionary of National Biography*, vol. vii, p. 181. ⁴ Cobbett, *Advice to Young Men* (1829), 1892, p. 198. ⁵ *La France Médicale*, 1911, No. 22, Variétés, p. xliii. ⁶ *Encyclopædia Britannica*, 1880, vol. xi, p. 642. ⁷ *Gentleman's Magazine*, 1755, vol. xxv, p. 124. ⁸ Whittia, *The Elements of Pharmacy, Materia Medica, and Therapeutics*, seventh edition. ⁹ Thompson, *A New Haemostatic and Surgical Dressing*, *Lancet*, July 29th, 1882, p. 136. ¹⁰ Duncan, *Puff-Balls in Uterine Haemorrhage*, *BRITISH MEDICAL JOURNAL*, November, 8th, 1884, p. 907. ¹¹ Hall, *The Haemostatic Properties of Puff-Ball* *New York Medical Record*, July 29th, 1893, p. 143.

AFTER-HISTORY OF GASTRO-ENTEROSTOMY FOR PEPTIC ULCER.

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THE present paper is a study of the after-history of 67 cases upon which the operation of gastro-enterostomy had been performed for ulcer of the stomach or duodenum. The operations have been done by many different surgeons, and for almost every clinical type of ulcer. They were performed at St. Mary's Hospital during a period beginning in 1904 and ending in April, 1910. In the most recent cases there was an interval of at least eighteen months between the operations and the inquiry as to the present condition of the patients, while in the older cases more than five years had elapsed.

The results here reported have been based upon the patient's freedom or otherwise from those symptoms which troubled him before the operation, or which still indicate active ulceration. Thus, when a patient, having been operated upon, reports himself entirely free from pain, sickness, and vomiting of blood, while he can enjoy

ordinary food, and has perhaps gained in weight, his result is marked as "excellent" (E).

Supposing, however, that a patient states that he is little better, and that his pain, vomiting, etc., have not improved or that the improvement be only very slight, his result is recorded as "bad" (B).

It is remarkable that the great majority of all cases are easily classified into one or other of the above categories. If any improvement has taken place, it is in most cases complete. There have, however, been some in which the recovery has been only partial, and these are classified respectively as "good" and "fair" (G), (F).

Where results are recorded as excellent there is no possible doubt that this is a true description of the case, for, as a rule, the patients themselves are most enthusiastic when referring to their condition. Similarly, there has been no hesitation in stamping any case as failure when the patient is still troubled with symptoms; for, even though pain, vomiting, etc., may have been slightly reduced, if the patient is still conscious of disease in the stomach or duodenum he has not been cured by the operation.

THE MORTALITY OF THE OPERATION.

Out of 92 cases there were 7 deaths immediately following the operation (7.6 per cent.). All these deaths occurred amongst the first 39 cases; throughout the last 53 cases there was no death.

The causes of death were as follows:

- 1 general peritonitis due to perforation of the ulcer just after the operation.
- 1 general peritonitis from leakage of the anastomosis.
- 1 septic bronchopneumonia.
- 2 collapse.
- 2 causes unknown.

The death of the first case was almost unavoidable; it could, perhaps, have been prevented by invaginating the ulcer at the time of the operation, but, as the liability of the ulcer to perforate can scarcely be ascertained during the operation, invagination is rarely performed. This case was an unfortunate accident. The second case—due to leakage—was the result of faulty technique. This was one of the earliest cases of the series. Where the ordinary method of suture is employed leakage at the site of anastomosis is very rare. In one case, in 1904, Murphy's button was used; the patient died soon after the operation, from melaena. The third patient died from bronchopneumonia, quite independently of the special nature of the operation. This patient would probably have died whatever operation had been performed.

Two patients died of collapse during the first week. The collapse may have been due to the gravity and duration of a serious operation performed upon a patient probably exhausted by a succession of haemorrhages, and a long period of semi-starvation from continued vomiting. Another cause of the collapse may have been haematemeses or melaena following operation. This is not an infrequent cause of death. In neither of these cases, probably, did the operation contribute to the speedy death of the patient, for in the first instance—death due to collapse from exhaustion and low vitality—the patient would have died if not operated upon; and in the second—death from haemorrhage—the operation probably had no part in starting the bleeding.

Thus of the 5 cases of death the causes of which are known, 2 died owing to unfortunate accidents, 2 died in spite of the operation, and in 1 only was death due directly to the operation—the case in which the anastomosis leaked. So much has the technique improved during the last few years that this cause has been practically eliminated.

AFTER-HISTORY OF 68 PATIENTS.

Of the 92 cases of the series 68 have been traced; of these 3 have died in the interval (4.4 per cent.). Probably others of the 92 cases not traced have died, and this would account for the failure to trace them. From the accounts furnished by their friends, it appears that 1 died of perforation, 1 from "a recurrence of the malady" (? haematemeses), and 1 from a cause unknown. Thus the total mortality of the operation, plus that of the uncured ulcer after operation, is 10.9 per cent. These figures should be compared with the mortality of the disease when treated

by medical means. Apparently the statistics here collected would show that the immediate danger of gastro-enterostomy is serious (7.6 per cent.), but under present conditions it is exceedingly slight; there has, for instance, been no death in the last 53 cases, that is, since 1908.

The general results of the series can be stated in 67 cases.

Classification of Results in 67 Cases.

Result.	No. of Cases.	Percentage.
E.	29	43.2
B.	26	38.8
G.	6	8.9
F.	6	8.9

Thus nearly half the cases were in no way ameliorated. Reckoning E and G together, and B and F, we have approximately 52 per cent. cured and 48 per cent. not improved. Ample proof is thus afforded that gastro-enterostomy is not indicated promiscuously for all kinds of peptic ulcer. At the same time, it is an important conclusion that the results are very sharply defined, inasmuch as 55 of the cases are either completely cured, or in no way improved, while only 12 cases are partially relieved. Supposing, on the one hand, the bulk of the cases were partly cured and only a small proportion showed a decisive result of good or bad, then the results would not be so significant, but as the effect of operation is so markedly successful in 43 per cent. and so hopelessly bad in 38 per cent. it is clear that there must be some very real difference in the etiology of the disease, or the pathology, or the exact performance of the operation which renders surgical treatment thoroughly successful or absolutely useless.

Age and Sex.

If the age of the patients and its effect on the prognosis be examined, it will be seen that, generally speaking, the older the patient the better the outlook. Thus:

Table of Ages.

Age.	No. of Cases.	Result.	
		Excellent.	Bad.
Below 20... ..	1	0	100 %
20 to 30	13	23 %	77 %
30 to 40	14	28 %	72 %
40 to 50	20	65 %	35 %
50 to 60	14	72 %	28 %

The age limits were 19 and 61, and the average age was 40.

From this table it would seem that the age of the patient is an important factor, but this is probably only apparent, for the type of ulcer varies with the age.

Again, the question of sex seems to influence the prognosis. Of 63 cases, there were 35 males and 28 females, and approximately one-third of the females and two-thirds of the males were cured. There were 23 males and 11 females over the age of 40; of the 23 males 20 were cured, and of the 11 females only 4 were cured.

Duration of Symptoms.

The duration of the symptoms is some indication of the chronicity of the disease; but on examining the series it has been found that no relation exists between the chronicity and the result of operation. Some of the patients had suffered for less than one year, while others had had symptoms for more than fifteen years; but the number of "cures" is distributed equally. It has been suggested that gastro-enterostomy is suitable for the chronic ulcers, and not for the acute variety; but these cases afford no evidence to support this.

Character of the Pain.

The character of the pain, however, is of great importance, for the figures show that the result of operation depends very largely upon the time after food at which

the pain occurs. This varies from immediately after a meal to one and a half hours, and, in proportion as this interval is long, so is the prognosis good. Clinically, the ulcer is frequently diagnosed as gastric or duodenal by a consideration of this feature of the pain, and it will be seen from the table below that cases of duodenal ulcer, as a rule, do much better after this operation than cases of gastric ulcer. Physiologically, duodenal and pyloric ulcers may be considered together, both forms tending to cause stenosis.

Position of the Ulcer in 64 Cases.

Position.	No. of Cases.	Result.	
		Excellent and Good.	Bad and Fair.
Gastric	24	38 %	62 %
Duodenal and pyloric	37	70 %	30 %
Not stated	7	—	—

Mode of Action of Gastro-enterostomy.

The question whether the ulcer is gastric or duodenal is of far greater importance than either age or sex. The pathological effects of the two forms of ulcer are usually quite different. The important pathological effect of duodenal and pyloric ulcer is pyloric stenosis, and it is probably in the relief of this condition that gastro-enterostomy has its greatest usefulness. The anastomotic opening provides a means of drainage, and this is probably the secret of the success of the operation in so many cases of this kind. For example, cases of pyloric carcinoma owe their relief after this operation to simple drainage. Therefore, whether the actual ulcer be healed or no, the stenosis and its attendant train of symptoms is certainly cured, and the first effect of this is to maintain the stomach at rest and relieve it of a volume of fluid continually in contact with the ulcer. Now just as drainage of any other hollow viscus, such as the bladder, promotes its recovery from a septic state, so drainage of the stomach probably has a most important bearing upon its recovery from an ulcer which is in a septic and progressive condition.

Gastric drainage may also be accomplished by means of lavage, though not so perfectly as by gastro-enterostomy, for, in the case of lavage the fermenting fluid is removed at intervals only, whereas by anastomosing the stomach with the jejunum a continuous drainage is maintained and a retention of irritating fluid never occurs. One of the cases was x-rayed after a bismuth meal, and the fluid was seen to pass very quickly out of the stomach, so that there was scarcely time to obtain good photographs.

Though the patient owes much of his distress to dilatation caused by stenosis, and its relief from this condition is easy to understand, undoubtedly a true healing of the ulcer with cicatrization is promoted in those cases where there has been frequent bleeding, for hæmatemesis and melaena are often completely arrested. Some claim that the healing of the ulcer is due simply and solely to the drainage effected by the operation, which prevents its constant contact with septic fluid, but, while drainage clearly relieves stenosis, some other factor is probably concerned in the healing of the ulcer.

Of the pathogenic factors associated with peptic ulcer, one of the most important is hyperchlorhydria. Of those cases in which a test meal analysis was performed, it was found that the vast majority suffered from a hyperacidity; in fact, one of the surest aids to the diagnosis of simple ulcer is the presence of this excess of acidity. Indeed, it has been shown that experimental gastric ulcer can only be produced or maintained when the acidity of the stomach is above the normal (Bolton). Hence it follows that the relief of this condition should be one of the first aims in the treatment of peptic ulcer.

The administration of sodium bicarbonate destroys the acidity; but in gastro-enterostomy we have a more efficient method, for by this operation the acid fluid is not allowed to accumulate.

The effect of the operation on hyperchlorhydria can be determined by the analysis of test meals by the usual method; and from tables of such cases, published by

Dr. W. H. Willcox, it can be seen that the total amount of acid is materially diminished.

From a study of the analysis before operation some idea can be formed of the probable success of the operation, for the results bear some relation to the amount of acidity. Thus, reckoning the total acidity in terms of hydrochloric acid, we have:

Acidity before Operation.

Total Acidity.	Result.	
	Excellent.	Bad.
Between 0.12 per cent. and 0.19 per cent. ...	5	3
Between 0.22 per cent. and 0.3 per cent. ...	13	3

Reckoning 0.15 per cent. as the normal, we gather that those cases with a definite hyperchlorhydria from 0.2 per cent. to 0.3 per cent. show better results than those cases not associated with hyperacidity; and it is in accordance with theoretical considerations that this should be so.

At first sight it might be imagined that the diminution of acidity after gastro-enterostomy is due to regurgitation of the alkaline juice of the duodenum into the stomach. This cannot be the case to any great extent, however, for the amount of bile in test meals drawn off is, as a rule, so slight that not sufficient alkali can have regurgitated to have neutralized the excess of acid. In some cases no bile at all is found; in others, only the slightest trace, showing that the amount of regurgitation is inappreciable. But it is easy to understand how the acidity is corrected when we remember the part played by the anastomosis in the drainage of the stomach. By these means accumulation of the gastric contents is prevented, and although there may be a hypersecretion of acid, the rapid drainage into the jejunum prevents it from raising the percentage of acid in the gastric juice.

Thus does gastro-enterostomy, by drainage of the stomach, bring about the two essential conditions for the cure of ulcer—namely, rest and normal acidity. Rest is so important for recovery from disease of any other part of the body that it is only to be expected that it should be imperatively necessary for the stomach and duodenum. The degree of rest secured by this operation for the duodenum is almost absolute, for the first part of the duodenum—where the ulcer usually occurs—is thrown into a state of complete physiological inactivity. This may partly account for the better results in the case of the duodenum.

THE OPERATION AND AFTER-TREATMENT.

I.

From what has been stated above, it is clear that a cure of the disease depends upon permanence of the anastomotic opening, for as soon as the drainage becomes ineffective the former conditions recur, and fresh ulceration is likely. In some cases of cicatricial pyloric stenosis it is impossible for the opening to close, for any fistula will remain open as long as there is obstruction below. This may be an additional reason why the operation is so successful in cases of pyloric stenosis. But when the ulcer does not cause an obstruction of the pylorus, closure of the artificial opening is possible, and perhaps probable.

In only two cases has it been possible to determine the size of the opening, and in each case it was still patent.

CASE I.—J. C. Duodenal ulcer, and slight degree of hour-glass contraction of the stomach. Gastro-enterostomy had been done near the cardiac end. April, 1910: Laparotomy, stomach opened, and anastomosis admitted three fingers. The pylorus admitted one finger, and was artificially stenosed.

CASE II.—H. S. Gastric ulcer. Gastro-enterostomy in January, 1909. Readmitted August, 1910, for melaena, etc., and laparotomy was performed in December, 1910. The opening admitted three fingers, and the pylorus was artificially stenosed. Three months after the patient was quite well.

When, however, the stenosis is due to pyloric spasm associated with an ulcer in its vicinity, free drainage of the stomach will lead to a relaxation of the spasm, as in other parts of the body. The function of the pylorus will then be restored and the gastro-enterostomy opening will fall into disuse, as all such fistulae do, when the obstruction to the *viae naturales* is relieved. In this way the ulcer may

be healed and the patient permanently cured. But, on the other hand, the old condition of affairs may be reproduced when the anastomosis closes, and it is possible that a further ulcer will be formed, thus accounting for some of the many relapses. If this be the case, a measure perhaps indicated is artificial closure of the pylorus so as to reproduce most nearly that type of case—permanent pyloric stenosis—which does best after gastro-enterostomy. In two recurrent cases of this series this was done, but not sufficient time has yet elapsed to judge of the results.

In those cases in which the pylorus is quite patent and no obstruction exists it is difficult to see how gastro-enterostomy can be of much benefit, for one of the two important morbid conditions—retention of septic fermenting fluid—cannot exist, and the other—hyperacidity—can be little relieved by the operation, for there is already sufficient drainage through the pylorus. Such cases are those of gastric ulcer situated well away from the pylorus, with little scar contraction and atonic dilatation of the stomach. It is probable that this is the type which reacts so unfavourably to surgical treatment. Artificial closure of a healthy functional pylorus is, however, a serious measure, and one hardly likely to be of any use in such cases.

II.

In earlier days a much debated question was whether the anastomosis should be made on the anterior or posterior wall of the stomach. Latterly, however, it has been decided that what is known as posterior gastro-enterostomy is the operation of choice, and unless there be some strong contraindication, such as the presence of adhesions, the anterior operation is never performed. Throughout this series only one or two anterior operations have been done, and then only because the posterior was not possible. We cannot, from these few cases, judge the relative merits of the two operations, but it may be accepted that the reasons set forth in favour of abandoning the anterior operation are very cogent, and that the result of the operation as practised to-day must be correspondingly better.

III.

A further point of discussion has been the position of the anastomosis on the posterior wall—that is, whether it should be placed near the cardia or pyloric antrum. Unfortunately, it has been impossible to obtain the records of the exact position of the opening, and no statistical conclusions can be drawn from this series. This point, however, is probably of some importance, for the question ultimately resolves itself into this, Which position will make for the best drainage?—drainage being the aim of gastro-enterostomy. Bismuth meals show that, immediately after eating, the food occupies the fundus of the stomach for a short time, while the pyloric antrum remains comparatively empty and contracted. Later the antrum dilates, receives a portion from the cardia, and a series of churning movements commence, the semi-digested mass being finally ejected through the pylorus. As the motor activities of the two halves of the stomach differ, so do their secretory functions. The fundal cells furnish the acid, and probably the pepsin also. Drainage of the fundus will relieve it of its distension by preventing its acting as a receptacle, and the fundus will discharge its contents immediately, so that gastric digestion will scarcely take place, and no accumulation of hydrochloric acid, which is secreted by the fundal glands, will occur.

But when the anastomosis unites the pyloric antrum with the jejunum drainage will not occur immediately, but only when the antrum receives its portion of the meal from the fundus. The normal churning movements of the antrum will immediately drain the contents into the jejunum, and the fundus will consequently discharge itself into the antrum more quickly than normal. Thus the difference is chiefly in the rapidity of drainage. When the opening is near the fundus, drainage is more rapid than when near the antrum, and acid will scarcely be present.

From these considerations it is seen that the result of operations will be better in cases of hyperchlorhydria when the opening is near the fundus, whereas for pyloric stenosis the anastomosis should be made with the pyloric antrum. This question gives rise to many more reflections, which, however, cannot be considered here.

Other differences in methods of operating are the formation, or not, of a loop of jejunum, and the size of the opening. The "no loop" operation is almost invariably performed at present, and the size of the opening should err rather on the side of capacity, in order to obviate premature closing. As in the previous cases, the notes of this series do not yield sufficiently full details, and no conclusion can be drawn.

POSSIBLE CAUSES OF THE FAILURES.

1. *Recurrence of the Original Ulcer, or Its Failure to Heal.*

(a) Closure of the anastomosis. The causes of this have already been considered.

(b) Persistence of those conditions which either gave rise to the ulcer or prevented it from healing.

The causes of gastric and duodenal ulceration have been discussed freely of late, and some light has been thrown thereon by Dr. Bolton; but it is not yet known definitely what gives rise to the ulcer. However, there are some suspected causes, such as oral sepsis. This condition should certainly be corrected some days before operation, and the mouth be kept in good condition.

The second and most important question is that of diet. The patient, and often his doctor, regard the operation of gastro-enterostomy as the complete and final means of cure, instead of realizing that it is no more than an excellent means of helping the stomach to cure itself. He forgets that careful dieting over a long period, together with frequent administrations of alkali, are almost as necessary and important as the operation. Many cases of gastric ulcer are cured by these means alone; therefore, will it not add greatly to the chances of complete and permanent cure if operative treatment is supplemented by careful medical treatment? Gastro-enterostomy is usually employed in cases which have failed to react to medical treatment, though in nearly every case under such a régime there is improvement, relapse occurring when the patient resumes his former dietetic life. The carelessness of the patient with respect to his diet is probably the commonest cause of relapse in this series—made up of hospital patients who, unfortunately, are often unable to select their food. But where gastro-enterostomy is followed by carefully regulated medical treatment, not necessarily strict, but reasonably moderate, the best results can be obtained.

2. *Formation of Jejunal or Gastro-jejunal Ulcer.*

Several cases have been reported, some being discovered at the operation for perforation. With Dr. Bolton's work in view, we may attribute such ulceration to hyperchlorhydria. There may be other causes, the nature of which we do not know, but so long as we remember that an experimental ulcer can be produced only in the presence of hyperacidity, we have at least one means of prevention in the administration of alkali and judicious dieting referred to above.

3. *Apparent Relapses.*

In these cases the ulcers are probably healed after gastro-enterostomy, but notwithstanding, the symptoms of pain and perhaps of vomiting and hæmatemesis persist, or return at a varying interval.

1. *The Pain of Adhesions.*—Simple ulcers of the stomach and duodenum give rise to adhesions between these organs and the neighbouring serous surfaces. In the majority of these cases the patient suffers no pain, but when adhesion exists between the anterior wall of the stomach and the abdominal wall, pain is probably a persistent symptom, for the parietal peritoneum is known to be very sensitive. Each time the stomach moves relatively to the abdominal wall, as it does after meals, there will be a drag on these adhesions, and consequently a pull on the parietal peritoneum. In such cases the pain will be very obstinate, entirely unrelieved by simple gastric sedatives, such as sodium bicarbonate, hydrocyanic acid, etc. In those cases in which the ulcer was noted to be on the anterior wall of the stomach at operation and the patient shows no permanent improvement, adhesions may be suspected as the cause of failure.

2. *Carcinomatous Change.*—It is known that about 60 per cent. of cancers of the stomach arise on the sites of old simple ulcers. Chronic and unhealed peptic ulcers are specially liable to this form of degeneration, but it is

possible that carcinoma may originate on the scarred site of an old ulcer healed by gastro-enterostomy. If this be the case there will be a relapse of the symptoms, with the other signs usually attendant on cancer of the stomach.

GENERAL CONCLUSIONS.

Reviewing the results of this series broadly, we see that as a general rule gastro-enterostomy is excellent for men of middle age who suffer from duodenal ulcer, especially if associated with some pyloric stenosis, whereas failure generally follows operation in cases of young women suffering from gastric ulcer.

Thus, of 12 females under 35—all subjects of gastric ulcer—10 cases were complete failures, and 2 only were successful. Some of these cases were in young and anaemic women, and on opening the abdomen no ulcer was found. There were 4 cases in which no ulcer was discovered, and of these 3 did badly. Probably in these 4 cases no ulcer existed, and it is clear that operative treatment could have been of no avail.

A more exact knowledge of the symptomatology and morbid anatomy of the ulcer might enable us to predict, with even more confidence, the result of gastro-enterostomy.

SUMMARY.

1. The results of treatment by gastro-enterostomy are generally either excellent cures, or complete failures.

2. The immediate mortality of 92 cases is 7.6 per cent., but of the last 53 cases it is 0.

3. The general results are: 43 per cent. excellent; 38 per cent. bad.

4. Prognosis is much better when the patient is over 40.

5. According to sex, 69 per cent. of males are cured; 28 per cent. of females are not improved.

6. The duration of symptoms is of no assistance in forecasting the result of operation.

7. The length of time elapsing between the meal and the onset of the pain is of great importance; the longer it is the better the outlook.

8. Duodenal ulcers yield very much better results than gastric ulcers; the gastric give 38 per cent. of cures, duodenal 70 per cent. of cures.

9. Cases of pyloric stenosis yield the best results.

10. The degree of hyperchlorhydria is of importance, cases showing a total acidity of over 0.2 per cent. reacting well, cases with a normal acidity doing badly.

11. The improvement effected by the operation is probably due to the relief of dilatation, pyloric spasm, and hyperacidity by the drainage of the stomach.

12. Failures may follow the closing of the anastomosis.

13. The position of the anastomotic opening on the posterior wall of the stomach may be of great importance.

14. Failures may be due to:

(a) Recurrence, or failure to heal of the original ulcer.

(b) Formation of jejunal ulcer.

Apparent relapses:

(a) Adhesions—causing pain, vomiting, etc.

(b) Carcinomatous degeneration.

15. Cases where an ulcer is not found at operation do badly.

In conclusion, I would like to express my thanks to Mr. J. Ernest Lane, F.R.C.S., and the other members of the surgical staff of St. Mary's Hospital, who have kindly given me permission to use their cases.

THE Illuminating Engineering Society (32, Victoria Street, London, S.W.) has done good service in following a recent American precedent and reprinting from its official organ for general circulation a pamphlet with the title *Light and Illumination: their Use and Misuse*. It gives a few simple recommendations on this subject. The reader is told concisely what kind of illumination to avoid, how to obviate the evil of glare and dazzle, how to concentrate the light where required, and how to secure its effective distribution. He is also assisted in the choice of globes, shades, and reflectors, and instructed in the part which walls and ceilings play in the lighting of home, shop, office or factory. To do all this within the compass of a threepenny pamphlet, and to do it without treading upon any commercial corns, or showing any preference for this or that illuminant, is a useful achievement. The instructions are helped out with several illustrations which show even more clearly than the text what kind of lighting is deficient and prejudicial to the sight.