endeavour to get the men first to do surface work, and then to attempt work underground. In view of the numbers working comfortably with nystagmus, as already shown, a large proportion, at any rate, ought to be able to return. The Yorkshire colliery owners have approached the ophthalmic surgeons of the county and their own medical officers, the so-called compensation doctors, and these have with one accord agreed that the plan is a desirable one and ought to be tried. I am convinced it will be successful in getting many men back, as I am sure the knowledge that if they have nystagmus they will draw full compensation and not be required to work has led many men to make claims.

Nystagmus is certainly worse in men with a weak nervous system, low resisting power, and weak constitutions, and is aggravated by excesses and low tone. If, therefore, such a man is leading an absolutely lazy life there is not much chance of his getting any better, since with nothing but compensation coming in he is insufficiently fed and goes from bad to worse. It is also a known fact that of colliers off work the nystagmus men drink the most, and get into most trouble, probably because of their low resistance power in more ways than one. For these men much the best course, and one generally admitted to be such, is to get them to do some work instead of loafing; and with occupation and better food tone will be maintained, and they will be much more likely to improve. Before the Compensation Act there was very little said about nystagmus and traumatic neurasthenia. Evidently cases of nystagmus existed before the complaint was scheduled, but only a small proportion was heard of. When, however, men realised they could get compensation for it and began to examine each other for it, and got to know that medical men generally considered them totally incapacitated from pit work and entitled to compensation, then the numbers went up. The claims go so far that miners' nystagmus is blamed in cases sent to lunatic asylums for disseminated sclerosis, cerebellar tumour, also for cases of high myopia and hereditary nystagmus, as the oscillation of the eyeballs is the only thing for which a claim can be made. As evidence of how little is known of the degree of incapacity caused by nystagmus and its duration a verdict was recently given by a county court judge reducing the award to a man because an ophthalmic surgeon is stated to have said that the limit of duration of nystagmus is two years, and that previous to the Workmen's Compensation Act the duration was much shorter, and implying that if it lasted longer the man must be malingering. As most of us know, there is no limit to incapacity from nystagmus.

My foregoing remarks have been made with a view to showing you that miners' nystagmus is a most complicated subject. It is very difficult, if not impossible, to state whether a man suffering from it is able or unable to work; and with the number of cases steadily increasing year by year, where is it going to land the employers, especially when the ideas of county court judges, decisions of the Court of Appeal, employers, and medical men are greatly at variance, though they generally tend to look upon it as causing absolute incapacity? Is there any way by which we can tell definitely that a man is certainly incapacitated from work by his nystagmus? If a man holds his head well back, with his eyes partly closed and looking down, his state is probably bad, as that position gives maximum stability with convergence of the eyes, in contradistinction to looking up, with the eyes diverging, which gives minimum stability and brings on nystagmus. Then tremulousness of the eyelids, of the head and neck muscles, and even of the body muscles shows undoubted incapacity.

I have information that whereas the claims on account of nystagmus made on the Yorkshire Coal Owners' Mutual Indemnity Company, Limited, for the first six months after the disease became scheduled in 1907 were only 15, in the year 1911 they were 225. With this enormous increase, and seeing that the claimants have the disease in no different form to the 25,000 men working in Yorkshire pits of their own freewill, something in the way of legislation should at once be taken in hand to meet the situation.

An interesting fact is that when the disease was scheduled it was expected that the claims from Lancashire would far exceed those from Yorkshire, but time has shown that for one claim in Lancashire there are nine in Yorkshire, leading one to the conclusion that in Yorkshire the fact of the men being paid full compensation and not required to work

induces those with nystagmus to claim compensation, and is therefore a wrong principle.

The conclusions I have drawn in working out my paper are that when a man claims to be and is admitted to be incapacitated by nystagmus, after a reasonable period during which he has been under constant observation, if his condition warrants his being employed, he should eventually resume work under ground, but as a commencement occupation above ground should be provided. For, as I have shown, there is no doubt that a man with bad nystagmus can work and do good work, and is no worse for doing it; and certainly the attitude of the medical profession towards the disease—viz., that as soon as a man was diagnosed to have nystagmus he should not be allowed to work in the pit, and should be advised never to return—has been responsible in great measure for the present state of affairs. Seeing, however, that many of us brought in contact with the disease now know that the willing men can work with nystagmus, and are doing so, I should like to plead that a different attitude be taken up, and instead of immediately looking upon a man with nystagmus as totally incapacitated we should, with the exception of serious cases, urge the claimant to continue work, knowing that he can do so without injury to himself.

Sheffield.

PERFORATION OF GASTRIC OR DUODENAL (PYLORIC) ULCERS.¹

INFERENCES ON MODERN TREATMENT DRAWN FROM HISTORIES OF PATIENTS WHO HAVE RECOVERED.

By EDRED M. CORNER, M.C. CANTAB., F.R.C.S. ENG.,
SURGEON AND LECTURER ON PRACTICAL SURGERY TO ST. THOMAS'S
HOSPITAL AND TO THE CHILDREN'S HOSPITAL,
GREAT ORMOND-STREET.

In the Erasmus Wilson lectures delivered before the Royal College of Surgeons of England, London, in 1903,² the pathological and clinical uniformity of gastric, duodenal, and other perforations of the alimentary tract was urged, the pathological process being termed an acute infective necrosis. In the *Journal of the American Medical Association* for August, 1908, Mr. W. J. Mayo insists yet again on their clinical "oneness." The uniform character of the treatment also asserts the similarity of their characters.

In the present communication I would suggest that it is most convenient to classify the ulcers particularly under discussion as *gastric* ulcers, which are present at the cardiac end or in the body of the stomach, and *pyloric* ulcers, which term includes ulcers on either side of the pylorus—i.e., in the stomach or duodenum. This classification suggests the partial giving up or limitation of the time-honoured words "duodenal ulcer," but is more practical than any other, gets over the difficulty of deciding if a particular ulcer is duodenal or gastric, and would serve, if others agree with me, to distinguish when the suture of a perforated ulcer is likely or not to require a gastro-enterostomy. The name "duodenal" would be retained for ulcers beyond the first part of the duodenum—i.e., the pyloric area.

The Question of the Performance of a Gastro-enterostomy.

There is already collected a vast literature on the subject of gastric and duodenal ulcers and their perforations, too large to be assimilable. A great deal of this literature only serves to show that it is possible for a patient to recover from the perforation of a gastric or duodenal ulcer, and that the mortality of such an event varies, in general, directly with the time allowed to elapse between the perforation and the operation. Until recently the main feature of the operation performed consisted of suture of the ulcer. Operative procedures used by surgeons to combat such a perforation have been added to by the suggestion of Sir Berkeley Moynihan, of Leeds,³ that a gastro-enterostomy should be performed at the same operation as that at which the ulcer was sutured. This addition to the operation on a patient often already perilously ill cannot be accepted without very

¹ Being a paper read at the Surgical Section of the Royal Society of Medicine on Feb. 11th, 1913.

² Constable and Co., London.

³ Transactions of the Royal Medical and Chirurgical Society, vol. xc., 1907, pp. 254-257.

strict examination. Indeed, the opponents to its introduction referred to it as an exhibition of surgical agility at the expense of the patient.

It is a matter of common clinical observation which must come before the notice of every surgeon that some patients in whom the perforation of a gastric or duodenal ulcer has been successfully sutured do very well, lead busy, useful lives, and, with exception perhaps of occasional dyspepsia, are quite well. It might well be asked how could a gastro-enterostomy possibly benefit such people? Yet Sir Berkeley Moynihan is not a man to "say it very deliberately" (his own words),⁴ and advise the performance of a gastro-enterostomy without good reason. This was advised in the discussion on operations for gastric ulcer before our predecessors, the Royal Medical and Chirurgical Society, in 1907. Five years have now elapsed, and during that time sufficient evidence must have accumulated to shed light on this point and enable us to see in what degrees both Sir Berkeley Moynihan and his opponents were right. I have, therefore, surveyed the literature on this subject since 1907, and have followed up (even to the employment of a private detective) as many patients as I could who have recovered from an operation for the perforation of a gastric ulcer. For permission to use their cases I must thank my colleagues, past and present, at St. Thomas's Hospital. The cases, 40 in number, were in the hospital between 1900 and 1910.

Of these cases about one-third, 33 per cent., were completely cured. The remaining two-thirds, 67 per cent., were unsatisfactory on account of dyspeptic attacks, inability to follow their occupations, the necessity of constant care in their diet, nervousness, depression, and so forth. I have given so rough an estimate of the condition of these people after operation because if another person was to make another and similar estimate from the same lot of patients he would form a different opinion. The reason for this is that he would regard, and perhaps quite rightly, many of my "unsatisfactory two-thirds" as satisfactory. This is well shown by the estimates of other authors:—

	Satisfactory.	Unsatisfactory.
French, 18 cases (Guy's Hospital Reports, 1907, vol. lxi.)... ..	83%	17%
Crisp English, 17 cases (Transactions of the Royal Medical and Chirurgical Society, 1903)	65%	35%
Paterson, 33 cases (THE LANCET, vol. i., 1906, p. 575)	48%	52%
Morton, 11 cases (Brit. Med. Jour., 1910)	30%	70%
Rendle Short, 23 cases (Bristol Medico-Chirurgical Journal, September, 1911)	34%	66%
Corner, 40 cases (Royal Society of Medicine, 1913)	33%	67%

The great variation in these estimates (142 cases in all) from Dr. H. French in 1907 (83 per cent.) to that of Mr. J. Morton of Glasgow in 1910 (30 per cent.) is due to the widely different views which can be taken quite intelligently of what is to be regarded as satisfactory and what is decided to be unsatisfactory. I have therefore formed a modest estimate, by chance following Mr. Short and Mr. Morton, of complete and incomplete cures. In this estimate the three of us (Short, Morton, and Corner) agree very well, and our results, based on 74 cases altogether, only show divergence from the other observers in degree, not in the principle involved. Hence it can be assumed that as one-third of the successful cases of the perforations of a pyloric ulcer are cured, a gastro-enterostomy done at the same operation as that in which the ulcer is sutured could have done the patients no good, and have been entirely an exhibition of "surgical agility at the patient's expense." Indeed, it would, and must, have done some of the patients harm, as we must all know of patients who have been made chronic invalids by the operation of gastro-enterostomy. It is obvious that no gastro-enterostomy is required in at least one-third of the cases of the perforation of a gastric or duodenal ulcer which come to operation. To try to find out why some patients are cured and some are not, I have gone carefully into the notes of the St. Thomas's and private patients, and as a result of this study I would suggest that the patients owe their cure largely to two factors: (1) the situation of the ulcer; and (2) the pathological character of the ulcer.

1. *The situation of the gastric ulcer.*—Those patients who became completely cured after the operation, as contrasted with those who did not, showed a far greater proportion of ulcers situated in the cardiac end of the stomach. Whilst the

patients whose perforated ulcers were pyloric and duodenal showed greater likelihood of the probability of their becoming the subjects of pain and dyspepsia or recurrent ulceration after operation, nothing can be said so definitely as to the influence of the situation of an ulcer on the anterior or posterior wall of the stomach, or on the greater or lesser curvature of the stomach. But it does seem reasonably certain that ulcers in the cardiac end and body of the stomach offer a far better chance of complete cure than do ulcers in the neighbourhood of the pylorus, whether they be on the anterior or posterior wall or on either curvature. The former do not, therefore, require a gastro-enterostomy, which will find its sphere of usefulness amongst pyloric ulcers. Mr. T. Crisp English,⁵ in his paper in 1903, says that these perforated ulcers existed to each other in the proportion of 54 per cent. of cardiac ulcers to 46 per cent. of pyloric ulcers, which suggests that a gastro-enterostomy may be required in about one-half (50 per cent.) of the cases operated on for perforated gastric ulcer. Mr. Alexander Miles,⁶ of Edinburgh, has, not unnaturally, differed in his estimate from that of Mr. Crisp English, making 50 per cent. of perforating ulcers cardiac and 50 per cent. pyloric. Amongst perforated pyloric ulcers (gastric and duodenal) some patients recover completely. Hence one is quite safe to argue that a gastro-enterostomy is not required in as many as half the cases of the perforation of a gastric or duodenal ulcer.

2. *The pathological character of the ulcer.*—That gastric and duodenal ulcers vary in their pathological character everyone knows, and no one will deny. There is a variety in which the tissue-death which constitutes the perforation of the ulcer is the last phase of the disease, leaving the walls of the ulcer ready to heal. Hence, when it is sutured it heals firmly, never breaks down again or by infection gives rise to satellite or recurrent ulcers. In consequence the patient gets completely well after the operation for the suture of the perforated ulcer. Apparently these ulcers occur in both ends of the stomach and in the duodenum. From our lack of knowledge at present we cannot differentiate them from the more troublesome ulcers, but we suspect them of being present as an acute ulcer in a patient who has had little or no symptoms before the perforation. In such cases a gastro-enterostomy is not required.

Up to now this paper has been concerned with negative propositions so far as the operation of gastro-enterostomy is concerned, and it is only right that some attempt should be made to show what evidence St. Thomas's Hospital can produce as the result of the five years which have elapsed since the great discussion on the treatment of gastric ulcers before the Royal Medical and Chirurgical Society in 1907. In the first place, it has been proved that to do an operation of gastro-enterostomy at the same time as the coeliotomy for suturing the ulcer may be more than the patient can withstand. One death at least may be attributed to this excess of zeal. Secondly, it is clear that a great many patients who had an immediate gastro-enterostomy became completely cured. Was it due to the gastro-enterostomy? Then there are some who are not completely cured in spite of the gastro-enterostomy. Is this due to the gastro-enterostomy? Further, it is very far from proved that the recovery-rate for the operation of suture of the ulcer and primary gastro-enterostomy was higher or lower than that consequent upon coeliotomy and suture. It is not clear in any way that a primary gastro-enterostomy is better than a secondary gastro-enterostomy (3-6 months or more later). Indeed, a secondary gastro-enterostomy apparently has made some unsatisfactory cases eminently satisfactory. Even this benefit cannot be attributed with certainty to the gastro-enterostomy, because some women who had recovered from the perforation of a gastric ulcer and were unsatisfactory on account of dyspepsia, constipation, flatulence, &c., became eminently satisfactory after marriage and its consequences—a change of living curing them.

To sum up the results of my examination of some 40 cases and five years of literature, it would seem that:—

1. Many subjects of the perforation of a gastric ulcer are benefited by a gastro-enterostomy. This is particularly true if the perforating ulcer is in the neighbourhood of the pylorus, gastric or duodenal.

⁵ Transactions of the Royal Medical and Chirurgical Society, 1903.

⁶ Edinburgh Medical Journal, 1906.

⁴ Ibid., p. 254.

2. It would appear, speaking generally, that a secondary gastro-enterostomy—i.e., after the patient has recovered from the immediate danger of the perforation—is better than a primary gastro-enterostomy.

3. It is better for the patient to have a secondary gastro-enterostomy when it is required than have the additional danger of a primary gastro-enterostomy which may not be needed. It would appear that the "betting" is rather against than for the gastro-enterostomy.

4. It has not been shown that a primary gastro-enterostomy presents such advantages over a secondary gastro-enterostomy that it, the primary gastro-enterostomy, should be practised in the treatment of the perforation of ulcers even when situated in the neighbourhood of the pylorus.

Post-operative Dyspepsia.

In the course of my study of these cases I have naturally met with features of interest which I will briefly narrate.

There is a clinical point of great moment in the history of patients who have recovered from the perforation of a gastric ulcer. It is very common for these patients to have an attack, often a long one, of pain and dyspepsia, beginning a few months after the operation. For instance, there is the case reported by Mr. A. R. Parsons,⁷ of Dublin, of a girl 19 years of age, who recovered from the perforation of a gastric ulcer and had an attack of "pain and dyspepsia" six months after the operation, and from which she was not free for about 18 months. She never required a secondary gastro-enterostomy, and when once the pain had disappeared it went for good, leaving her in an eminently satisfactory condition about two years after the operation. Personally, I have seen three patients whose "post-operative" dyspepsia was so bad and prolonged that I advised a secondary gastro-enterostomy; yet with medical means they were cured and have remained cured, none requiring operation.

Death from the perforation of a second ulcer generally is limited to a single instance in each published series of cases, as Dr. French⁸ has pointed out. There was one such instance amongst the author's series of cases. Hence it may be regarded as known but uncommon. Indeed, it seems less common than the perforation of a jejunal ulcer after a gastro-enterostomy, and I think it is clear that this phase of "post-operative" dyspepsia is eminently capable of cure by medical means. In fact, I would urge that it is anticipated by medical treatment and advice in every case of recovery from the perforation of an ulcer. In my experience it is far more common than is the need for a secondary gastro-enterostomy. Before closing this section of my communication I would like to say that, certainly with regard to the cases concerned in this paper, appendix-dyspepsia is of no great moment; but often it is well to remove the appendix when doing a secondary gastro-enterostomy.

Occlusion of the Pylorus.

In connexion with gastro-enterostomies, primary or secondary, done for the relief of ulcers in the neighbourhood of the pylorus, there is a very important point in technique which I would submit for your consideration.

All fluid whose habit it is to pass along a pipe has comparatively little tendency to escape through a lateral hole in that pipe; or, to put it another way, even when a lateral aperture is present, the great volume of the fluid will continue to flow along the pipe, and but comparatively little will escape through the lateral opening. A gastro-enterostomy is merely a lateral opening, and in consequence through it only a small proportion of the gastric contents will pass, especially of the lighter and fluid contents. Hence without pyloric obstruction a gastro-enterostomy is no panacea for ulcers in the neighbourhood of the pylorus or duodenum. This was excellently illustrated by a patient under the care of Mr. F. W. Mason, of Boston, Lincolnshire. The patient had a gastro-enterostomy done by Sir Berkeley Moynihan, a guarantee that it was well done. During the next four years the patient had pains, dyspepsia, and discomfort. At the end of that time, in Sir Berkeley's absence, I had to open the abdomen hurriedly. There was no jejunal ulcer present; indeed, the gastro-enterostomy opening was very contracted. But the patient had a large perforated ulcer in the first part of his duodenum. This case illustrates that the ulcer probably was not cured by the gastro-

enterostomy; again, that in the absence of pyloric obstruction a gastro-enterostomy tends to close (like any other lateral anastomosis not in the presence of obstruction to the flow directly onward).

Then I may mention another instance. A young woman was successfully operated upon by Mr. H. Sampson for me at the Bowes Park Cottage Hospital for the perforation of a pyloric ulcer. No gastro-enterostomy was done. A year later Mr. L. E. Barrington-Ward operated again, and again successfully, for the perforation of a pyloric ulcer. A secondary gastro-enterostomy was done later, and so far it works well, I would suggest that this is largely due to the presence of adhesions in the neighbourhood of the pylorus causing obstruction.

A better illustration is that of a young man who was successfully operated upon for a perforated gastric ulcer, a primary gastro-enterostomy being done. After a year of pain and discomfort it was needful to explore the abdomen again. The gastro-enterostomy was found to be excellent, and there was no trace of a jejunal ulcer. Hence the cause of the patient's pain and discomfort was most probably the passage of the gastric contents over the region of the former ulcer which had perforated—i.e., in the neighbourhood of the pylorus. These gastric contents could be made to pass through the gastro-enterostomy opening by occluding the pylorus. Therefore a ligature was passed round the pyloric end of the stomach and tied sufficiently tight to occlude the lumen. The effect of this simple proceeding on the man's pain was simply magical; when he came round from the anæsthetic the pain was gone! This occlusion of the pylorus was first suggested by Berg. Since this date I have always placed a ligature on the pyloric end of the stomach when doing a gastro-enterostomy for pyloric ulcers (or when the ulcers were believed to be pyloric), and I think that the patients have benefited therefrom. (Fig. 1.)

Further, I would like to say that, when the patient's condition allows of it, I have had better results from a posterior

FIG. 1.

A gastro-enterostomy by Roux's method, showing (by cross) the situation of the ligature for occluding the pylorus.

FIG. 2.

An ordinary method of performing gastro-enterostomy, showing the situation of the occlusion by ligature of the afferent loop.

gastro-enterostomy done after Roux's method than any other. The phrase "after Roux's method" has been used, as I believe that an anterior gastro-enterostomy was an essential part of Roux's original plan, whilst I have always used a posterior gastro-enterostomy. After it there is no vicious circle or regurgitation of bile into the stomach, and the operation is not marred by the "no loop" fallacy. In default of being able to do a Roux's gastro-enterostomy I believe that it is better to do an entero-enterostomy and place a ligature, not tightly, on the afferent loop of the jejunum between the entero-enterostomy and the stomach, as first suggested by Fowler. (Fig. 2.) This can be done at the first operation primarily, the patient's condition permitting, or later secondarily. But usually it is better done than left undone. Occlusion of the pylorus may be followed by much vomiting during the first day or two after operation if food is given, and owing to temporary swelling the gastro-enterostomy aperture is closed. In such cases the patient is given continuous infusion of saline per rectum, and no food by the mouth. Later water is given in small doses.

At the present time I have under my care an elderly

⁷ Dublin Medical Journal, 1906, vol. cxxi., pp. 81-92.

⁸ Loc. cit.

gentleman, 63 years of age, who has been operated on already twice—for appendicectomy and for an ileo-cæcal kink with intestinal stasis. The poor fellow really has a large duodenal ulcer adherent to his liver and pancreas (? carcinoma). For this I did a gastro-enterostomy with occlusion of his pylorus, with considerable amelioration of his condition.

From the brief notes I have given I would submit that occlusion of the pylorus is a very real measure to be considered as a valuable, or even a necessary, adjunct to gastro-enterostomy performed for the relief of pyloric (and duodenal) ulcers. As such I bring it to your notice. (The ligature is not tied tightly enough to ulcerate its way into the stomach, and is expected to become the foundation of a fibrous ring round the pyloric end of the stomach, permanently occluding it, as is the case with silk stitches elsewhere.)

Isolation of the Perforation by Tamponade.

Undoubtedly the best local treatment for a perforated gastric or duodenal ulcer is to close it by suture, and the abdomen with drainage. But there can be no doubt that one of the first difficulties which a surgeon meets in these cases is to close the perforated ulcer soundly and satisfactorily. The reason of the difficulty is that the stitches, used to close the perforation, "cut through" the sodden, swollen tissues in which they have to be inserted to close the perforation. If such "cutting through" happens under our very eyes, how often does it result in the loosening, or the total loss of hold, of the stitches on the tissues after the abdomen is closed and the patient is in bed? One cannot but surmise that many perforations deemed to be closed satisfactorily at the operation are not so an hour or two later. Yet in spite of this, patients who have been operated upon continue to recover. Hence there is a justifiable suspicion that cases of perforated gastric or duodenal ulcer can recover when the perforation is not closed, or at least imperfectly closed. In 1908 Mr. Walter R. Bristow and I⁹ put this to the test by not attempting to close the perforated ulcer in two patients; in one we "corked" the perforation with a tag of omentum, and in the other a veil of omentum was maintained in position by two or three stitches. Both patients recovered and had easy convalescences, unmarked by any feature, such as gastric fistula, which would suggest leaking through the perforation.

Since this date (1908) I have used the principle of isolating, but not closing, the ulcer on at least 15 occasions, including one perforation on the posterior abdominal wall. In two of these the end of a gauze plug was held by a catgut stitch in the aperture of the perforation. I have never lost a patient on whom this practice has been used. These patients have done uniformly well. Personally, I think better than do those in whom time was spent in closing (?) the ulcer by suture. As a general rule, the longer the time spent in suturing the perforation the greater the difficulty and the insecurity of the closure. Isolation of the perforation by tamponade has the advantage of being simple and of saving valuable time. No patient on whom it was done has ever needed a primary or a secondary gastro-enterostomy. No patient has had a gastric fistula or has in any way, such as by delayed convalescence, shown sign (or signs) of the non-closure of the ulcer. I may add that when the perforation is not sutured the end of a gauze drain is always placed next the ulcer and brought out of the wound. This drain is removed in about 36 hours under anaesthesia with nitrous oxide gas and not replaced. After operation the patient is placed in the Fowler position, saline solution is administered rectally and continuously, and nothing but water is given by the mouth for three days. Recently it has been my practice to enclose the isolating tampon of gauze in a longitudinally split rubber tube, a cigarette drain, part of which is left in position after the removal of the gauze.

Having shown the practicability of the successful isolation of a perforation with a gauze tampon, it may now be discussed what possible position may be taken by this procedure in the surgery of perforated gastric and duodenal ulcers. I would suggest this: The firm closure of the perforation and of the abdomen, without drainage, is undoubtedly the best treatment that can possibly be carried out. But this ideal is in practice more often unrealisable than realisable. Therefore, I would suggest that at first an attempt is made to close the perforation by suture. If this fails or appears to afford a doubtful closure of the perforation, no further time should be spent on it, but the ulcer plugged and drained. Thus I would

suggest, having first proved that it can be done successfully, tamponing the perforation with omentum and gauze is the second best line of treatment for the perforation of a gastric or duodenal ulcer; and that this second line of treatment is of much more frequent and general application than is the first. Indeed, the patients I have deliberately tried it upon have done so well that I believe, chiefly on account of its saving time, the isolation of these ulcers by tampon will become the first and most popular line of treatment except in cases operated upon very early after perforation of the ulcer.

Subacute Peritonitis, Chronic Peritonitis, and Adhesions.

All are very familiar with complications such as pelvic abscess or subdiaphragmatic abscess, but we are not so familiar with the course of a subacute or chronic peritonitis which may go on for weeks and against which vaccine or serum treatment is the sheet-anchor of our treatment. Let me quote an example.

I operated for the perforation of a gastric ulcer in a girl, 21 years of age, about 40 hours after the perforation. The perforation was closed by suture and its track isolated from the rest of the peritoneal cavity by omentum and a gauze drain. The pelvis and loins were dried through a subumbilical incision and the former drained. For between five and six weeks the patient kept having a very regular temperature, about 100° F. No signs of a residual abscess in the loins, pelvis, or subdiaphragmatic spaces were discoverable. There was nothing in the pleura or pericardium. Some albumin appeared in the urine. The bowels acted well, and food was taken. The abdomen was somewhat distended. There was a large leucocytosis. The left subdiaphragmatic region was explored in the hope of discovering an abscess, but only a large spleen, surrounded by perisplenitis, was found. Suffice it to say that the patient succumbed in spite of all treatment after an illness which lasted six weeks.

Then I have the case of a man who had a perforated gastric ulcer which was operated on some 12 hours after the perforation. Owing to the oedema of the tissues round the perforation it could not be closed satisfactorily. This man has had a subacute or chronic peritonitis going on for 12 weeks, from which he recovered slowly.

Consideration of these last two cases leads me to that of my first successful operation for the perforation of a duodenal ulcer (1901). The case illustrates a result of the peritonitis which may follow the perforation and be recovered from. An infinity of adhesions causing death is sufficiently unusual in these cases as to be worthy of record, the adhesions in general clearing up marvellously.

In July, 1901, a physically perfectly developed man, 34 years of age, was admitted to St. Thomas's Hospital. He never had anything the matter with him until he had abdominal pain four days ago. This pain increased, and there was no onset of symptoms which would suggest the sudden perforation of an ulcer. At the operation a perforation one-third of an inch in diameter was found about half an inch on the duodenal side of the pylorus. This was closed by sutures, and the peritoneum was washed with saline solution. After operation the temperature was irregular for seven days, reaching to between 100° and 101° F.; on the sixth day it reached 101.4°. The stitches were removed on the tenth day, and the wounds were clean. He had slight diarrhoea. Beyond this his convalescence was without incident. In December, 1901, he was re-admitted to the hospital for abdominal pain and obstinate constipation which rendered him miserable, and had caused him to seek refuge in alcohol. At operation it was found that every item of the alimentary canal was superlatively adherent to its surroundings, but not to the abdominal wall or the scars. In other words, his symptoms were due to superlative visceral adhesions. There were no signs of tuberculosis now or at his first operation. The man died about a fortnight after the exploratory operation.

Such a condition must have been the result of a widespread form of peritonitis arising in some "lowly" form of infection from which at first the man recovered, but was unable to regain sufficient power to "clear up" the adhesions, which led to his death in six months' time. The case has been brought forward from other points of view in the Erasmus Wilson lectures of 1903.¹⁰

Ventral Herniæ.

Examination of the patients who had recovered from an operation or operations for the perforation of a gastric or

⁹ Brit. Med. Jour., 1909, vol. i., p. 1288.

¹⁰ Constable and Co., London.

duodenal ulcer showed two facts about ventral hernia which are well worth consideration. Firstly, it may be premised that ventral herniæ are not infrequent after an operation for the suture of a perforated gastric or duodenal ulcer. Secondly, where two incisions were present, it was more frequent to have a hernia through the scar in the upper abdomen than through that in the lower abdomen. This fact is a reversal of the generally accepted dictum that ventral herniæ are more prone to follow scars in the lower than in the upper abdomen. Thirdly, the hernial protrusions through the scar in the upper abdomen were larger in general than those in the lower abdomen; but though more frequent and larger they do not give rise to so great a sense of weakness, disability, or discomfort as the latter do. From this follows another clinical feature—namely, when a patient complains of symptoms referred to the hernial protrusion in all probability they are due to conditions (of the stomach) underneath. Thus in one patient who came complaining of symptoms which he referred to the hernia, Dr. H. P. Hawkins found the signs of a dilated stomach and pyloric obstruction. A gastro-enterostomy relieved the symptoms of which he complained, but the hernial aperture was too large to be closed by suture, and so the hernia persisted, definitely and tritely proving that the symptoms were not due to the hernia, but to the pyloric obstruction beneath.

In conclusion, I would like to lay stress on what is a fairly obvious fact. Patients who have undergone such nervous shock as that accompanying the perforation of, and the operative procedures for the perforation of, a gastric or duodenal ulcer are extremely prone to become neurasthenic, so that they could not do what they used to do formerly, having to give up their occupations (such as of a painter, &c.). There can be no doubt that this neurasthenia and the brevity of convalescences in modern surgery, which are inseparable from the condition under discussion, have a great deal to do with the occurrence of dyspepsia and pain after the illness, such as are shown by those patients who were relieved by a marriage. This consideration makes the very various opinions of those who have worked at the condition of patients after recovery from the perforation of a gastric or duodenal ulcer comprehensible, and it must make us very careful not to recommend a secondary gastro-enterostomy for neurasthenia. So far as I have been able to discover, patients who have had a primary gastro-enterostomy are just as neurasthenic as those who have not.

Harley-street, W.

THE TREATMENT OF TUBERCULOSIS IN BRIGHTON.

—At its meeting on Feb. 20th the Brighton town council approved of a draft scheme for the provision of a dispensary and sanatorium for the treatment of tuberculosis. Already in possession of a sanatorium, Brighton is far better off than if it had to send its patients elsewhere, and the council has placed at the disposal of the Insurance Committee for the treatment of insured persons suffering from tuberculosis a pavilion at the borough sanatorium which comprises 53 beds in all—36 for pulmonary tuberculosis, 12 for joint diseases, and 5 for isolation purposes. The Insurance Committee has agreed to pay the sum of 27s. 6d. per week in respect of each patient received on its behalf in the sanatorium, and as a temporary arrangement, pending the adoption by the council of a permanent scheme, the sum of £15 per quarter in respect of dispensary treatment and the sum of £25 per quarter in respect of the services of the medical officer of health. The population of the area served by the scheme is 133,096, and the total number of cases of tuberculosis notified in the area during the period Jan. 1st to Sept. 30th, 1912, was 282 new cases and 163 re-notification cases. The net expenditure of the council in respect of the dispensary is put at £980, the patients during the year 1912–13 being estimated at 2080, and during the year 1913–14 4160. As regards institutional treatment the net expenditure during the year 1912–13 is given as £3202, and during the year 1913–14 £3585. Of the latter sum it is estimated that the council will not be called upon to pay more than £2000 a year. The council further decided that a tuberculosis officer is urgently required to act as officer to the dispensary, visiting physician to the sanatorium, and consultant and adviser for domiciliary treatment; and, subject to the approval of the Local Government Board, the medical officer of health is to be termed the chief administrative officer under the scheme for the treatment of tuberculosis.

THE CONTRACTION RING AS A CAUSE OF DYSTOCIA,

WITH A DESCRIPTION OF A SPECIMEN REMOVED BY HYSTERECTOMY DURING LABOUR.*

BY CLIFFORD WHITE, M.D. LOND., F.R.C.S. ENG.,

ASSISTANT SURGEON, SAMARITAN HOSPITAL, AND ST. MARY'S HOSPITAL PLAISTOW; OBSTETRIC PHYSICIAN TO OUT-PATIENTS, QUEEN CHARLOTTE'S HOSPITAL.

THE contraction ring as a cause of dystocia is one which is neglected in the standard text-books on obstetrics, and the ring itself is frequently confused with the retraction ring of Bandl which forms as a result of obstructed labour. A differential diagnosis of the two conditions is, therefore, attempted below.

Differential Diagnosis.

Contraction Ring.

1. A localised thickening of the wall of the uterus due to the contraction of the circular fibres over a point of slight resistance, most frequently over a depression in the child's outline or below the presenting part.
2. The uterine wall at the site of the contraction ring will therefore be thicker than it is either above or below.
3. The wall below is neither thinned nor over-distended.
4. The presenting part is not forcibly driven into the pelvis.
5. The child may be wholly or mainly above the contraction ring.
6. The body of the uterus above a contraction ring is usually relaxed and not tender.
7. Round ligaments are not tense.
8. A contraction ring may occur in the first, second, or third stage of labour.
9. A contraction ring does not vary in position as labour goes on.
10. A contraction ring is rarely felt on abdominal examination.
11. The patient's general condition is good.
12. Causation: premature rupture of the membranes; intra-uterine manipulations.

Retraction Ring.

The junction of the thinned lower uterine segment with the thick retracted upper uterine segment.

The uterine wall above the retraction ring is much thicker than it is below it.

The wall below a retraction ring is both thinned and over-distended.

The presenting part is or has been jammed into the pelvis.

Part of the child must be below the retraction ring.

The body above a retraction ring is tonically contracted and hard.

Round ligaments stand out.

A retraction ring practically always occurs late in the second stage of labour.

A retraction ring gradually rises as retraction of the upper uterine segment proceeds.

A retraction ring may frequently be felt per abdomen.

The patient's general condition is bad.

Causation: obstructed labour.

The existence of a local contraction of the uterus.—The existence of a contraction ring is proved by measuring the thickness of the wall of a uterus and noting that in the ring it is thicker than above or below. This was done in one of Philipps's cases, recorded by Holland,¹⁵ in Andrews and Maxwell's,¹ Schroeder's, Lusk's,¹⁸ and the specimen here described.

The ring forms over an area of slight resistance and tends to fit into depressions of the child.—In Andrews and Maxwell's case the ring corresponded with the groove of the child's thigh, in one of Budin's⁶ to the hollow of the knee. Forming below the feet in incomplete breech presentations its importance is insisted on by Lewis,¹⁷ Jardine, and de Bovis.⁴ It has also formed round the thorax (Chavane,⁸ Boquel³) and round the arm (Bué,⁷ Hicks,¹⁴ and others), but in the great majority of cases it forms round the neck. Finally, it may form below the presenting part (Smith,²¹ Sinnetamby,²⁰ Jardine, Formichella,¹¹ and others). The position of the contraction ring in the cases I have collected is:—Round neck, 45 per cent.; below the whole of the child, 21 per cent.; round the arm, 15 per cent.; round thorax, 9 per cent.; neck of after-coming head, 9 per cent. In showing the part played by the foetal outline in the formation of the ring an observation of de Bovis is of importance. The ring fitted tightly into the popliteal space of a child presenting as an incomplete breech. He dilated it with difficulty and finally reached a foot, but the prominence of the ring prevented the foot being brought down. On following the ring backwards to the level region of the child's back, he states that he was agreeably surprised to find that the ring became less and less marked till it was practically non-existent. He took advantage of this in finally delivering the child.

* Abstract of a paper read before the Obstetrical Section of the Royal Society of Medicine on Dec. 6th, 1912.