base of the ulcers had in them numbers of intestinal bacteria. We had no reason to suspect that the appendix had suffered, but microscopically it was ulcerated exactly the same as the intestine. Its mucosa had disappeared, and its lumen contained pus cells, epithelial cells, red blood corpuscles, and a few bacteria. The endothelial plates of many of the blood vessels and lymphatics were swollen and detached.

The impression left upon my mind by the histological examination of this intestine and appendix is that bacteria had little to do directly with this condition. In other severe kinds of ulceration of the appendix the invasion of the coats by bacteria is almost an invariable feature. On the other hand, the alterations in the endothelial linings of the vessels of the intestine and appendix suggest very strongly that they at all events were at fault. Many possibilities suggest themselves—were they inflamed by something which had entered them from the ulcerated surface, or were they altered by something conveyed by the circulation? The high temperature and the accelerated pulse show that some poison had entered the circulation, and that that entrance was synchronous with an aggravation of the intestinal disease.

We do not know, but it seems probable that the ulceration of the appendix began after that in the intestine, also it was obviously due to the same cause. I regret that this case has not been more scientifically worked up. We are quite in the dark as to the state of the splanchnic nervous system. Many things were tried to avert the fatal ending. The rectum and as much as possible of the colon were lavaged with weak solutions of nitrate of silver. The rectum was systematically drained with rubber tubing. Colotomy or typhlotomy were not tried although often discussed. Perhaps it would have been better to have tried one of these expedients. Clearly the removal of the appendix was out of the question.

REFERENCE.

¹ *The Diseases of the Intestines and Peritoneum*. Nothnagel; edited with additions by H. D. Rolleston, 1904, p. 278. This excellent work, which Dr. Rolleston has so ably edited, is most helpful.

An Address

ON

THE OPERATIVE TREATMENT OF CERTAIN SEVERE CASES OF INDIGESTION.

Delivered before the Oxford Medical Society.

By W. BRUCE CLARKE, F.R.C.S.,

Surgeon, St. Bartholomew's Hospital; Examiner in Surgery, University of Oxford, etc.

WHEN I was asked to read a paper before the Oxford Medical Society it seemed to me, on reflection, that there was no subject which could be of wider general interest than that of severe indigestion. It is interesting to the physician as well as to the general practitioner, because the number of cases of this condition which they are called on to treat must necessarily be numerous, and demand the exercise of much patience and skill in their management. This subject is also at the present time especially of great interest to the surgeon, because he is being called upon to supplement medical measures by surgical when drugs fail to alleviate severe conditions of this nature. I feel, therefore, that I may reasonably hope from the discussion, to which this is a prelude, to elicit some new facts—and I hope, too, some new indications—by which we may be enabled to learn more accurately how long it is justifiable to trust in medical treatment, and at what period the aid of the surgeon should be called for.

Without more ado, therefore, I will briefly put before you my own views on the indications for operative treatment, so that you may at once determine whether you agree with me or not.

The cases in which surgical interference is called for may be divided into acute and chronic. I will deal with the acute varieties to start with, because I do not think you will differ much with me in the propositions which I shall lay down about them.

1. Ruptured gastric and duodenal ulcers should always be treated surgically without delay.

2. Severe cases of hæmorrhage which threaten life should likewise be treated by opening the belly and securing the bleeding point or points.

3. When chronic ulcers of the stomach and duodenum cease to improve under medical treatment, surgical interference is indicated and is capable of affording much relief.

In order to enable me to devote the bulk of my time this evening to the consideration of this third proposition, I will merely allude briefly to ruptured ulcers and the surgical treatment of hæmorrhage from the stomach. The symptoms of a ruptured ulcer are generally characteristic. The patient who has usually suffered for some time previously from chronic dyspepsia, is suddenly seized with an attack of severe pain in the region of the stomach and duodenum, and becomes collapsed, usually before many minutes have elapsed. Sometimes he vomits the contents of his stomach. His pulse-rate speedily falls, and in severe cases the pulse is soon scarcely perceptible. If he is placed quietly in bed and kept warm with blankets and hot bottles, the general condition will speedily improve especially if a small amount of morphine is administered. This temporary improvement is often very deceptive. It is important to recognize the fact that it occurs, or the medical attendant may be liable to defer summoning the surgeon until the period for operative interference has well-nigh passed away.

If the diagnosis of this condition is unattended with much difficulty in those cases in which the symptoms are well marked, it is in some cases hedged round with considerable difficulty, and a great responsibility will always rest on the doctor's shoulders whether an operation be suggested at once or expectant treatment is decided on, at least for a time.

But even if an operation is decided on, no prudent surgeon would state that it should be undertaken on the spur of the moment. It is rare to find the patient's condition so grave within an hour or two of his seizure as to demand immediate interference. The more favourable moment to seize is shortly after the temporary improvement which I have just referred to has taken place, and if the warmth of bed and hot bottles is not sufficient to induce temporary abatement of the more urgent symptoms, an injection of a pint or more of hot saline solution, at about 100° F., into the rectum is usually attended by a very beneficial effect. It is certainly not easy, and probably not possible in all cases, to distinguish between a ruptured gastric and a ruptured duodenal ulcer, but when once the peritoneal cavity has been opened the distinction is not usually a difficult one. The fluid which issues from an ulcer of the duodenum is clear and limpid, and reminds one of the contents of an ovarian cyst, and at first is usually confined to the right side of the abdominal cavity, to which it is limited by the attachment of the mesentery. It is on this account that some of these cases are recorded as being mistaken for an attack of appendicitis, for the effused fluid finds its way into the right iliac fossa and gives rise to pain in that region. The sudden bursting of an abscess in this region of the abdomen, the rupture of a gall bladder, or plugging of the mesenteric veins may be mistaken for this condition, and so also may a ruptured tubal gestation. Errors in diagnosis have been recorded by various observers, but in most, if not all of them, an operation was urgently called for in order to save the life of the patient.

The fluid which issues from a ruptured gastric ulcer is usual greater in amount than that which finds its way out of a duodenal ulcer, mainly, I believe, because the stomach holds more than the duodenum, and also because stomach perforations are usually of considerable size and thus permit the easy escape of stomach contents. The character of the fluid which is poured out from the stomach when an ulcer ruptures varies much more in character and consistency than does that which comes from the duodenum, and this depends mainly on the stage of digestion at which the rupture occurs. It would appear from the observations of various surgeons that the ulcers which rupture are more commonly found on the front surface of the stomach or on the back of the first part of the duodenum. These regions, therefore, should be first searched by the operator. The search will be much assisted by a momentary inspection of the abdominal cavity as soon as it is opened. The direction from which the effused liquid is flowing forms a valuable guide to the position which the ulcer occupies.

The method which I usually adopt is to make an incision about 3 in. in length, parallel with the fibres of the right rectus muscle above the umbilicus, because an incision in this position gives good access to the part affected, and generally results in a good sound scar when it is healed. If the ulcer be not within reach from this incision it must be extended, and occasionally the whole rectus muscle will have to be cut across before it can be satisfactorily dealt with.

Assuming, however, that the stomach and duodenum are not bound down by adhesions, which is rarely the case in perforating ulcers, it is generally possible to bring up into the wound the aperture through which the contents have made their escape. When once the surgeon is face to face with the ulcer, several methods are open for its treatment. It may be excised, and its edges brought together by a fine silk suture, or the edges of the ulcer may be brought together without excision, and the peritoneal surfaces slightly inverted. Neither plan is easy of performance on account of the hardening of the neighbouring tissues, which is generally an accompaniment of these ulcers. Time is usually an important factor in the operation if the patient's life is to be saved. Latterly I have contented myself with simply drawing the edges together with sutures, and then covering the ulcer, if possible, with an omental flap. This method has, in my hands, succeeded better than any other.

When the sutures are inserted and tied, the stomach or duodenum, as the case may be, is returned into the abdominal cavity; and a glass drain is inserted through a fresh incision into that portion of the abdomen where the largest amount of fluid is found, the original wound being closed with sutures. This seems to me to be a better plan than placing a drain in the operation wound, as it leaves the wound free to heal, and, if suppuration occur, there is less chance of a hernia later.

Fig. 1.

The propriety of surgical interference in gastric haemorrhage is by no means so well established as in cases of ruptured ulcer, nor do I for one moment wish to suggest that it is likely to be called for in any large number of cases of gastric ulceration. If, however, so large an amount of blood has been lost suddenly as to threaten the patient's life, or if by repeated haemorrhages of smaller amount such a condition of weakness and anaemia is induced as to suggest the likelihood of a fatal issue, a good case has, it seems to me, been made out for the treatment of this condition by surgical rather than medical measures.

There are several preparations in the museum of St. Bartholomew's Hospital of gastric ulcers, in which the walls of the splenic artery have been attacked by the extension of a gastric ulcer, and death has resulted from severe and, one might almost say, sudden haemorrhage. Such cases are often quoted as indications of the need of surgical interference. But even if we admit—as, no doubt, we all should—that they are indications of the need of surgery, it by no means follows

that the surgeon's efforts would be likely to meet with success in all such cases. I was once a witness some years back of a death which occurred from this cause. The patient in question was a young woman who had been suffering for some time from symptoms of gastric ulcer, but I have no recollection that there was anything in her symptoms which would have led one to suppose that her death would take place from haemorrhage. She was suddenly seized with a violent pain in the stomach, and vomited, I think I may say, several pints of almost pure blood. In less than an hour she had breathed her last. Ulceration had taken place into one of the arteries of the pancreas. I doubt if any surgical interference could have been prompt enough to save her. It is difficult to obtain a record of the length of time that elapses between the onset of the bleeding and the death of the patient in these cases of sudden haemorrhage. The cases which in all probability will yield better results are those which do not exist in museums, for the simple reason that if they did they would show no morbid change that would be visible to the naked eye. I cannot do better than relate one which came under my care a short time back.

I was asked by one of my medical colleagues to see a young woman who had suffered for several months from the usual symptoms of gastric ulcer. Several severe attacks of bleeding had occurred, and as the last attack had left her all but

Fig. 2.

pulseless, surgical interference was suggested. I opened her abdomen, and incised the stomach. I introduced my finger into its interior, and could find no evidence whatever of ulceration. There was, however, one spot from which blood was oozing. I passed a stitch of fine silk round it and arrested the bleeding without difficulty. I took care to transfix some of the mucous membrane, so as to prevent my ligature from slipping. After careful search I found one or two more bleeding points and treated them in the same manner. The opening in the stomach was closed in the ordinary way, and the organ returned into the abdomen. A good recovery resulted, and I understand the patient has remained in good health since.

Cases of this kind have been recorded by other surgeons, and they open up a vista of future success. So far as one can judge from published cases, a fine ligature, which transfixes the mucous membrane, offers the best chance of success. A cautery has been tried in some cases, and has, I believe, resulted in failure in every instance.

But, as I told you when I began my remarks, my object is to draw your attention rather to chronic cases of ulceration, which have not, I think, received the full amount of surgical attention which they deserve, and, in order that I may emphasize the class of case to which I am now referring, I have here a series of lantern slides of stomachs with ulcers to which I should like to direct your attention for a few minutes. They are taken from specimens in the Museum of St. Bartholomew's Hospital.

Fig. 1 shows a portion of the front wall of the stomach of a girl, aged 20, who was brought into the hospital some years ago. She was seized with sudden pain, became collapsed, and died just twenty hours after the onset of her attack. The clinical records state that no history whatever could be obtained of previous gastric trouble, beyond possibly slight pain occasionally after food. This had not been severe enough to lead her to seek medical aid.

The specimen represented in Fig. 2 consists of a portion of the stomach and duodenum, which displays a well-marked and deeply-cut ulcer situated just at the pylorus. It can hardly be said to belong either to the stomach or duodenum, as it invades both of them equally. It was taken from a man, aged 45, who had suffered for many years from severe pain after food. He had been unable to earn his living for some time. He appears to have suffered from haematemesis and constantly vomited his food. His death was due to exhaustion, and he was supposed during life to have suffered from cancer, but the microscopic examination of the specimen does not support that view.

Fig. 3.

Fig. 3 exhibits a large ulcer close to the pylorus situated on the back wall of the stomach. This specimen was taken from a man, aged 36, who had suffered from pain after food for three years. One week before his death he was admitted into hospital in consequence of copious haematemesis, which continued, and was accompanied by melaena until death took place, which was caused by the weakness induced by repeated bleeding, and did not result from a large and violent attack of haemorrhage. The base of the ulcer was found after death to be in direct communication with an aneurysm of the splenic artery, which was closely attached to the ulcer. The pancreas is stated to have been hard and thickened.

Fig. 4 is a dilated stomach in which the pylorus and commencement of the duodenum are affected by cancer. The interest which attaches to this specimen is largely enhanced by the fact that it is stated that there was no infection of the surrounding parts.*

It is only by a careful study of the various specimens which have been preserved in our museums to illustrate the diseased conditions that affect the region of this body, coupled with the clinical histories of these cases, that we can form any idea of

* A large series of lantern slides of other specimens, in addition to those which are here figured, were displayed in order to demonstrate the actual conditions that are met with in the ulcerative affections which attack this region of the body. For the photographs from which these illustrations are taken I am indebted to Mr. Glenn.

the onset and progress of the diseases in question, and of the steps that must be taken to treat them by surgical measures when medical treatment has done all that it can for them.

What can be more striking than the first of these cases? A large ulcer, which must have taken some time to form, and in its centre a smaller one which perforated and caused death in less than twenty-four hours. There can be no doubt of the propriety of surgical interference in such a case.

Two of these preparations display marked ulceration just at the pylorus; in one the disease was innocent in character and in the other malignant, but in both cases the pain is stated to have been excruciating. Whenever the pain is severe in these cases it is almost absolutely certain that the ulceration is situated close to the pyloric orifice. In all probability the pain is due to the squeezing of the food over the ulcerated surface during its passage from the stomach to the duodenum, which process gives rise to much of the pain that is complained of. The preparation in which the ulceration is innocent in character displays another point of importance. It proves very clearly that if the ulcer had been healed completely during life, the only possible result would have been to block the pylorus and prevent the contents of the stomach from finding their way into the duodenum. It is difficult to see what plastic operation on the pylorus could possibly have remedied this state of affairs. It is equally certain that no plastic operation on the pylorus could have been of any avail in the case of cancer. Though both of these cases were diagnosed as cancer during life, in only one of them was the diagnosis confirmed at the autopsy. An accurate diagnosis in an early stage of this disease always presents a difficulty.

Fig. 4.

The other case in which an aneurysm of the splenic artery exists is only one of many preparations, which all illustrate the possibility of invasion of an adjacent artery by the process of ulceration.

I think, then, we may fairly say, after an examination of these specimens, that chronic ulceration of the stomach which is not amenable to medical treatment, especially when such ulceration is situated in the neighbourhood of the pylorus, demands surgical interference.

The next question to ask ourselves is, What are the means available for treating this condition surgically? The earlier attempts of surgeons were directed towards enlarging the pylorus either by forcible dilatation (Loreta's operation) or by pyloroplasty. Neither of these plans are much in favour at the present time, because, even if they are successful at first, subsequent experience has shown that cases treated by either of these plans are liable to relapse. An examination of the specimens of pyloric obstruction which are preserved in our museums shows that whether the ulcerative process is innocent or malignant in character it is liable to spread some distance from the spot where it began, and that is is often so situated as to preclude any possibility of restoring a suitable outlet for the stomach in the natural position. The larger one's experience in these cases and the more often one is called upon to treat them by operative interference the more important does this view of the case become, and hence it is that gastrotomy, in which two healthy portions of gut

are selected for union, has come to be regarded as the form of operation best suited to the majority of these cases.

A portion of the jejunum situated about 5 in. or 6 in. from its commencement is now usually selected as the most suitable point for connexion with the stomach. The jejunum is very movable at this spot, so that union can easily be effected without any undue tension on the surrounding parts. The transverse mesocolon is scratched through with some blunt instrument and a portion of the lower and back wall of the stomach selected which is fairly free from blood vessels, and it is here that an opening is made and the stomach united to the jejunum.

The general principle of the method which is employed will be rendered perfectly clear by a reference to the accompanying diagram (Fig. 5); but it cannot be denied that there are disadvantages in an operation thus performed. The bile and pancreatic fluids must, it is clear, follow the course which is indicated by the arrows, and these fluids are liable to pass back into the stomach before they reach the lower parts of the small intestine. Though in many instances this does not appear to influence the future progress of the case, this is not always so by any means. A few days after the operation the patient may begin to vomit quantities of dark-brown material, which speedily results in a fatal issue, owing to what is known

Fig. 5.

as the vicious circle being set up. Various methods of operation have been devised with a view to preventing the passage of the bile and pancreatic fluids into the stomach. The simplest method of effecting this object is to make a second junction between two adjacent loops of jejunum. (See Fig. 5, B.) The effect of this plan, which was, I believe, first suggested by Lauenstein, is to carry the bile and pancreatic fluids direct into the intestine just below the gastrojejunostomy opening, and thus obviate any chance of the vicious circle supervening. Since I have adopted this method of operation I have not been troubled by the occurrence of the vicious circle after these operations.

There can be but little doubt that the ideal operation for the relief of pyloric obstruction is pylorotomy, inasmuch as the natural relationship of the parts is preserved, there is no vicious circle to be feared, and the occurrence of a peptic ulcer in the duodenum has, so far as I am aware, never been described as a sequel to pylorotomy.

Quite recently Finney has described a new method of pyloroplasty as he terms it, which is in reality a gastroduodenostomy which includes the pyloric orifice. Armour has discussed the possibilities of the operation in a paper which has appeared in a recent issue of the *BRITISH MEDICAL JOURNAL*,¹ and amongst other remarks states, "active ulceration would appear to be possibly the only objection to this operation."

Few surgeons would differ from this statement, but it must equally be borne in mind that it is in order to stem the progress and minimize the effects of active ulceration that the operation of gastrojejunostomy is usually undertaken, and as will be seen by the details of the cases which I am about to narrate, gastrojejunostomy is often the only method of gastro-

intestinal anastomosis that can be safely performed in these cases.

CASE I (Abstract).

A. G., aged 54. Had suffered from severe indigestion for several years before I saw him. He could rarely keep a meal down, and was quite prevented from earning his living by pain and the weakness which it produced. He had at times suffered from haematemesis. Before I saw him he had been under treatment both as out-patient and in-patient at various hospitals, and had been taught to wash out his stomach. With great care he managed to get along, but obtained no permanent relief from his symptoms.

His abdomen was carefully examined both with and without an anaesthetic, but nothing abnormal could be detected, except that he always complained of some pain on pressure in the epigastric region. An exploratory operation with a view to treatment was decided on, and an incision was made through the right rectus muscle just above the level of the umbilicus. The stomach was found to be drawn up towards the liver by adhesions, and the pylorus was hard and thickened. The adhesions were so dense that it seemed futile to make any attempt to break them down. A gastrojejunostomy was therefore performed by the retrocolic route, and the two adjacent loops of jejunum were united in the manner I have just described. Recovery was uneventful, and before the patient left the hospital he was able to take solid food with ease and said he felt perfectly well.

CASE II (Abstract).

E. T., aged 38, was under my care in St. Bartholomew's, and the following history was obtained of his condition:

Vomiting and haematemesis during the previous six months; admitted he had drunk a good deal. On the morning of the day on which I saw him was seized with a severe pain whilst driving his cab. As the pain got worse and he felt very ill he was brought to the hospital and admitted, as he was evidently seriously ill. After he had been put to bed and carefully examined his condition was as follows: The right half of his abdomen, especially at the upper part, was tender to touch, and scarcely moved at all with respiration. Inspiration was painful.

I saw him for the first time about six hours after his seizure. His general condition had improved somewhat, and he felt fairly comfortable as long as he was fairly still. Temperature, 101.2°; pulse, 90. The tenderness in the upper part of the abdomen had increased somewhat, and the whole of this area was dull to percussion. The intense tenderness, coupled with the previous history of sickness after food and haematemesis, seemed to point to a leaking gastric or duodenal ulcer. The abdomen was opened through the right rectus. There were abundant adhesions. On reaching the pylorus some turbid serum welled up, accompanied by a small amount of gas. The pylorus itself, together with the stomach and duodenum for about an inch on either side of it, was firmly bound down to the surrounding parts. The condition was an exceedingly difficult one to deal with. The patient was in no fit condition to stand a pylorotomy, and it seemed impossible to get at the ulcer to close it. Moreover, it was clear that there was considerable pyloric obstruction.

As far as possible the extravasated stomach contents were sponged out. A considerable amount had leaked into the right half of the abdomen. A glass drain was inserted midway between the ribs and the crest of the ilium. I closed over the ulcer with an omental flap, and performed a posterior gastrojejunostomy, so as to ensure a free passage for the stomach contents. The immediate result was perfectly successful so far as his life was concerned. More radical measures may possibly be considered later if it is deemed necessary.

CASE III (Abstract).

E. W., 59, who had suffered from severe attacks of indigestion for some years past, first came under my care in January, 1904, with what appeared to be an attack of chronic intestinal obstruction, which was relieved by rest in bed, enemata, and careful feeding. A month or two later he returned evidently much worse, thin and emaciated, and a lump could be felt in the region of his pylorus. After being suitably prepared for a few days he was submitted to operation. An incision was made, as in the two previous cases, through the right rectus. The diseased mass, which involved the pylorus, came up easily into the wound. There were no enlarged glands along the lesser curvature of the stomach.

A clamp was placed on the duodenum, which was severed about half an inch beyond the limits of the growth. The stomach was cut across about three inches from the pylorus. The upper part of the stomach wound was closed, and the lower part united to the duodenum by end-to-end anastomosis. Catgut was employed for the mucous membrane, and a continuous silk suture for the peritoneal and muscular coats. An excellent recovery resulted and the man is now perfectly well more than a year after the operation.

At the time when this growth was removed little doubt existed in my own mind that the case was one of cancer, and so it turned out to be. But a careful microscopic examination demonstrated that a cancerous growth was to be seen only in a small portion of the mass that I had removed, and it belonged to the columnar-celled variety.

These three cases are excellent illustrations of types of disease that give rise to severe indigestion, and yet are amenable to surgical treatment only.

The first case was one that had been under various physicians, and, though benefited for awhile during the time that treatment by dieting, rest in bed, and washing out was being

carried on, he speedily reverted to his former condition as soon as these methods could no longer be pursued. When the stomach was explored the explanation of this state of affairs was obvious. The pylorus was so contracted that food could only with great difficulty be made to pass through it.

The second case, when it was explored, exhibited much the same condition as the first, but illustrates in addition the possibility of rupture in these long-standing cases of ulceration, and the dangers to life which such patients may encounter in addition to the pain and inconvenience which they suffer.

The third case is especially instructive, as it affords evidence of a simple ulcer with surrounding inflammatory trouble becoming the seat later on of malignant disease, and emphasizes the great difficulty which must always exist in deciding from mere inspection and touch whether such a case is innocent or malignant in character.

It is undoubtedly difficult at the present time to speak with certainty on the indications for operative treatment in these cases of severe indigestion. The class of case to which I am referring owes its symptoms to the fact that the stomach is crippled and the pylorus obstructed. When this is the case, whether the obstruction is due to cancer or not, the stomach should be explored and the pyloric obstruction, if possible, removed. If removal of the mass is impossible an almost immediate relief can be obtained by having recourse to gastrojejunostomy.

REFERENCE.
1 Vol. I, 1905, p. 123.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, Etc.

OTOLITH REMOVED FROM THE EXTERNAL AUDITORY MEATUS.

A. L., aged 30, female, consulted me on account of extreme tinnitus aurium and deafness. She stated that she had been slightly deaf since a child, but during the last two years the deafness had become very much worse and the noises in her head unbearable. Two years ago she consulted a medical man about her ears and underwent treatment for a month; since then she has received no treatment. She has had slight discharge at times from the left ear.

On the right side the external auditory meatus was quite clear; the membrana tympani was opaque, thickened, and retracted, but there was no discharge.

On the left side the external auditory meatus was entirely blocked, so that the speculum could not be used. With a probe a hard substance was felt, filling the meatus. Repeated syringing failed to move it. After separating it all round the meatal margin with a thin probe I extracted with forceps a cone-shaped foreign body. All that could be seen after removal was a bed of granulations, which bled freely. I sent this specimen to the Clinical Research Association and received the following report:

The otolith was found by microchemical methods of analysis to consist of epithelium and waxy material, with calcium phosphate and carbonate and traces of triple phosphate. No nucleus of any foreign material could be found. The otolith weighed $\frac{1}{4}$ gr.

The patient came to see me a few days after removal of the otolith; the granulations were discharging a little pus. She stated that the noises in the head were much better, but there was no alteration in her hearing. She also stated that she had no idea that there was anything in her ear before coming to see me.

Unless I am mistaken, this is a unique case, as I have never seen any publication on otoliths.

H. J. GODWIN, M.B., B.S., F.R.C.S.,
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Winchester.

BREECH PRESENTATION COMPLICATED BY SPINA BIFIDA AND HYDROCEPHALUS.

On February 1st I was called to see Mrs. C., aged 41, in labour. She had previously been delivered of four healthy children, both the labours and presentations being normal in all respects. The last confinement took place seven years ago. I found the os about three-quarters dilated. The membranes had ruptured some hours previously. The breech was presenting. All went on well till the breech and legs had been born. A few weak pains sufficed to expel the body of the

child another few inches—sufficient, at all events, to bring to view the commencement of a spina bifida. Then the pains ceased altogether. I waited in vain for three-quarters of an hour for another. I then examined the abdomen, and found that the uterus had not diminished in size to any appreciable extent. My first thought was that it was a case of twins, and that the second child was obstructing the delivery of the first.

I gave chloroform, and introduced my hand and arm into the vagina and uterus, and found the latter occupied by an enormous hydrocephalic head. I had no perforator with me, but determined to try ordinary domestic sharp-pointed scissors. The head was high up, and the vagina, being already obstructed by the body of the child, and the scissors rather short, it was a very difficult business to direct the scissors with the left hand and puncture with the right. After many attempts I succeeded in perforating at the nearest possible point, and with my left hand in the uterus squeezed as much fluid as possible out of the hydrocephalic head. I then inserted my left forefinger in the mouth, and, with my right index and middle finger on the shoulders of the child, pulled hard and delivered. The uterus contracted at once and very soon expelled the placenta. The spina bifida was of the syringomyelocoele variety. It was covered not by skin but by a thin translucent membrane. It was quite flat and bleeding, and had the appearance of a large broken blood blister. It involved practically the whole of the dorsolumbar region. In length it measured $4\frac{1}{2}$ in., in breadth 2 in. The appearance of the head was that of a large bag of bones. I took a measurement of where the maximum vertico-mental measurement ought to be and found it 10 in. In other respects the child was normal and well developed. The mother, so far, is doing well. It is interesting perhaps to note that five years ago I had to perforate the after-coming head for the same reason (hydrocephalus).

Alfreton.

F. M. BINGHAM, M.R.C.S., L.R.C.P.

THE TUBERCULOUS MONKEY AS A PET.

A POSSIBLE and unsuspected source of tubercle infection came under my notice recently in Sierra Leone. A soldier asked my laboratory attendant to make away with a pet monkey which had been a long time sick and which he wished to have put out of its misery. I took the opportunity of making a *post-mortem* examination. I found the monkey suffering from disease of the lungs, intestines, and mesenteric glands, the disease being most advanced in the abdominal parts. Staining showed plenty of tubercle bacilli.

Monkeys are not common enough at home to make this matter of any importance, except in "Zoos," where many of these animals I understand die of consumption; but barracks and private houses abroad are always well supplied with monkeys. It is evident that they may be a source of danger to man. This particular monkey had been a station hospital pet. There were tuberculous cases in the hospital. It is quite possible the monkey contracted the disease from one of them. Obviously the precautions which were taken to disinfect sputum, etc., of the men were not of much utility while the monkey was shedding bacilli around. We are more nearly related to the monkey than to the cow, and there can be little doubt that human and monkey tuberculosis are identical.

Woolston, Hants.

F. W. SMITH, L.R.C.P.I.,
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SURFACE MARKING OF THE CHEST.

I QUITE agree with Dr. J. L. Rentoul¹ that the old regional divisions of the chest are almost useless, and I would like to draw his attention to a new regional chart which will be found illustrated in the third edition of my *Index of Symptoms*. I was struck by the resemblance of the ribs and spaces to degrees of latitude, and I proceeded to form degrees of longitude by adapting the columns between well-known vertical lines such as the mammary, the sternal, and the parasternal. Each rib bears its number, each space its number with an "x" added. On the other hand, the vertical columns are lettered; thus, that between the mammary and the parasternal line is the "internal mammary column" (I.M.). The intersection of column and zone forms the new region, each region having the number and letter of its congeners—for example, the normal position of the heart's apex is I.M. 5x left, since it is in the fifth interspace and within the internal mammary column. I claim that these new regions are small enough to

¹ BRITISH MEDICAL JOURNAL, JANUARY 28th, 1905, p. 184.