I have only time just to mention two other conditions which may simulate renal calculus; they are:—

10. *Growth of the Kidney in its Early Stage, and Malignant Disease, involving the last Dorsal Nerve.*—I have not had sufficient space for the quotation of cases; but I may briefly allude to one here which shows how closely the presence of renal calculus may be simulated, and how misleading evidence may be. Four years ago a patient, aged 44, came under my care with hæmaturia, wearing pain, tenderness in the right loin and thigh, and oxaluria. His childhood had been passed in Norfolk, and as a lad he had been cut by Mr. Birkett for stone in the bladder. I sounded him twice, and finding no stone, I swept the sound in contact with the bladder in different directions, in the hope of detaching fragments of growth, if one were present. No relief being given by drugs, I explored the right kidney, and could find nothing abnormal. Four days after the operation, while all seemed to be doing well, the patient died very suddenly. The *post-mortem* examination showed (1) a primary carcinomatous growth in the bladder of a somewhat unusual kind; it involved the apex, as a flocculent, superficially-ulcerated area; (2) a ring of secondary deposit surrounding the last dorsal nerve, just at its exit from the spine; (3) a mass of enlarged glands around the inferior cava, and at one spot sprouting into it.

C. CHIEF PRACTICAL POINTS IN THE PERFORMANCE OF NEPHROLITHOTOMY.

1. To count the ribs. That this is not an unimportant detail is proved by the fact that Prof. Dumreicher, of Vienna,¹⁷ accidentally opened the pleural cavity in an attempt to remove a pyelo-nephrotic calculous kidney. *Post mortem*, the last rib was found to be rudimentary, and the pleura projected a good deal below the lower edge of the eleventh rib.

2. To make a sufficiently free incision, especially in a stout patient, and a deep loin. Additional room may be gained by converting the usual lumbar incision into a T-shaped one, or by making use of König's incision, in which the muscles are cut through as far as the rectus, and the peritoneum pushed forwards. A small stone in a kidney will always be liable to be overlooked, but a surgeon does not give his patient or himself a fair chance who is content with exposing the kidney through a limited incision, and then trusting to punctures with a needle.

3. To pack away with sponges the colon, which is often troublesome distended with flatus in these cases.

4. If the stone cannot be felt either in the pelvis or after palpation of the posterior and anterior surfaces of the kidney, this should be drawn up and out of the wound as far as possible, and again examined, a careful watch being kept upon the pulse.

5. In puncturing the kidney, to try, as far as possible, to open the calyces systematically.

6. If palpation and acupuncture fail to find a stone, the kidney should be carefully opened and sounded. I will recur to the subject of hæmorrhage shortly, and take first the best site of opening the kidney. Hitherto in five doubtful cases I have incised near the pelvis, as the viscus is thinner here, and as the surgeon can better reach the calyces. Mr. Jordan Lloyd, however, recommends the following method of exploring the interior of a normal kidney:¹⁸ "When the kidney is exposed through a lumbar wound I puncture its lower end with a long-bladed tenotome in a direction upwards and inwards, making for the lowest of the calyces. If the surgeon is observant and his knife is keen he will readily appreciate the moment when a cavity is struck by the altered resistance offered to the puncturing instrument..... It is important, because a tenotome may be pushed up to its handle in a normal kidney without tapping its interior cavity, having travelled *along* the kidney substance rather than *through* it. Into this opening I pass a child's bladder sound, and systematically explore the whole of the pelvis." It is advised that the blade should be not more than one-third of an inch in length, a stem of about 7 inches, and the size of a No. 3 English catheter. It should be passed at once to the top of the kidney cavity, a distance of nearly 4 inches, and the exploration should be carried out systematically from above downwards, the point being rotated in all directions, so as to investigate both tubes and calyces as the instrument is withdrawn. In this manner Mr. Jordan Lloyd has

succeeded in finding a calculus, after needling and palpation had been assiduously tried with negative results.¹⁹

7. Hæmorrhage from an incision into the kidney is certainly arrested by firm, careful plugging with strips of sal alembroth gauze. On the five occasions on which I have used this plan I have removed the strips the next day with the aid of a few minutes' anæsthetic, gas sufficing for this. It is said that this plugging may cause vomiting. This did not occur in any of my cases. It ceases on the removal of the plugs. Care must be taken that the plugging is thoroughly done. If inadequate it will have to be repeated in a few hours—perhaps more than once—thus leading to exhaustion and setting up cellulitis, which may of itself be fatal, owing to the important relations of the kidney.

8. Sources of difficulty in removing the stone.²⁰ The chief of these are: (1) A very mobile kidney, which gets away deep in the wound; (2) a stone situated on the anterior surface and near the entrance of the vessels; (3) a small stone in a sacculated kidney, the stone falling into one of the sacculi, and thus being hard to find.

9. Multiple calculus in a suppurating, damaged kidney. If the question of nephrectomy arise this step should, as a rule, be deferred, and the kidney thoroughly drained, for (1) additional shock and loss of blood will be avoided. (2) The condition of the opposite kidney, very possibly calculous also, will be made clearer by waiting. (3) The bulk of the kidney will be lessened by drainage. (4) Though a source of discomfort (if an open sinus persist) it may still do some and important work.

10. If the kidney has been much disturbed it should be stitched *in situ*.

LECTURES ON THE SURGICAL ASPECT OF HEPATIC ABSCESS.

Delivered at the Hospital for Consumption and Diseases of the Chest, Brompton.

By RICKMAN J. GODLEE, M.S., F.R.C.S.,

Surgeon to the Hospital and to University College Hospital.

LECTURE II.

It will now be convenient to give a few typical examples of tropical abscess, it being understood that it is difficult to meet with a case which does not present some special peculiarity.

CASE X.—Lieut. H., age 26, invalided home from India with threatening liver abscess, was seen by Sir Joseph Fayrer some months before he came under my care. He was put under treatment and much improved, so that he considered himself well enough to take open-air exercise, hunting, and so forth. On returning to show himself, it was found that he had an abscess pointing at the epigastrium, over which the skin was slightly reddened. There was great tenderness at the epigastrium, and some over the lower ribs in the axilla. He was strong, well-built, and well nourished, but with the characteristic dirty yellow complexion described above.

I opened the abscess in the epigastrium, finding plentiful adhesions, on February 5th, 1884, letting out 4 to 6 ounces of yellow pus. The discharge in this case assumed the characters I have just described: thin serum and dark red muco-pus. It gradually diminished, and the abscess was completely closed by March 11th.

¹⁹ The same paper contains very helpful remarks on the nature of the kidney pelvis. I have only space for a few of them. Failure to find a stone when present "depends mainly on two points: First, an inaccurate conception of the precise nature of a kidney pelvis, and, secondly, the faulty methods adopted for the examination of the kidney's interior..... Instead of the pelvis being a funnel-shaped membranous sac it really consists of a cluster of branching tubes, so that the procedure of exploring the kidney's interior by means of a finger introduced into the pelvis through an opening in the kidney substance is practicable only in dilated kidneys, and is absolutely impossible when we are examining the interior of the viscus in anything approaching a normal condition. I have not yet found a healthy human kidney into the primary pelvis tubes of which I could introduce my index finger."

²⁰ The various positions which calculi may occupy in the kidney and the precautions demanded in dealing with them have, very recently (JOURNAL, November 16th, 1889), been fully dealt with by Mr. H. Morris. His remarks will repay most careful attention.

¹⁷ See a paper by Dr. Lange, of New York (*Ann. of Surgery*, October, 1889), in which he calls attention to the investigations of Dr. Holl on this matter.

¹⁸ *Pract.*, xxxix, 173.

The case presented the following features of interest: 1. The temperature up to March 4th was usually normal or subnormal in the morning, but rose to 99° or just over 99° in the evening. 2. The bowels were very obstinate, not acting except after a sulphate of soda mixture and an enema. 3. Tenderness and pain continued for three weeks, during which time he could only lie on his right side, or on the face. 4. The tongue was clean and the appetite for the first few days was good for milk; but soon he had almost absolute anorexia and nausea. At last, after three weeks, he suddenly felt a desire for a boiled potato, and his appetite returned. During this time his temper was abominable.

There was considerable trouble with the tube in this case. The dressings were of carbolic acid gauze.

CASE XI.—Lieut. W., aged 23, was under the care of Sir Joseph Lister and Sir Joseph Fayrer, but I had the privilege of assisting at the operation and dressing the case afterwards, and am kindly allowed to publish it. In November, 1878, he had fever and hepatitis in Hyderabad, from which he recovered. In May he had hepatitis and jaundice; in September, hepatitis and diarrhoea, there having been traces of blood for some months previously. In October he was sent to England, where he arrived in December. At this time he was jaundiced, with a furred tongue, no appetite, clayey motions, profuse night sweats, and occasional rigors. The liver dulness was increased upwards, and an abscess was projecting over the lower ribs in the axilla. Temperature from normal to 101°. On December 20th Sir Joseph Lister opened the abscess in the seventh intercostal space, 3 inches outside the nipple. Profuse hæmorrhage occurred for a few minutes, but quickly stopped. He recovered without a bad symptom, except one slight attack of ague. The jaundice quickly disappeared, the tongue cleaned, and the appetite returned. The wound was completely healed about February 20th. The only peculiarity in this case is the occurrence of intense jaundice, which certainly is not common. I have not seen it in any other case.

CASE XII.—Lieut. M., aged 27, went to India in 1877, and stayed there for four years, returning in 1880. During his time in India he had several attacks of fever, and was at last almost invalided with it. He remained at home till 1882 and quite recovered his health. He first began to feel pain in the right shoulder in May, 1883, which was followed by pain in the right side and loss of appetite and power of digestion. His bowels acted freely, the motions being light-coloured and loose. He had no rigor, no vomiting, and no dysentery. He became yellow, but not actually jaundiced. His habits with regard to alcohol were very temperate. When I saw him in November, at the request of Sir J. Fayrer he was emaciated and of an ashy colour, but he was not really jaundiced. The tongue was clean, the pulse 92 and moderately strong, the temperature a little over 99°. The skin was cool. The bowels only acted with medicine, the motions being sometimes light, sometimes dark. The liver dulness was not increased downwards, and only slightly upwards (fifth rib in the nipple line, sixth anterior axillary line, seventh posterior axillary line). The upper extent of the liver dulness distinctly diminished when the patient lay upon the left side, which I believe is an important point to notice, as it probably indicates that the pleura is not abolished by adhesions to the upper limit of the dulness, but simply that the lung is pushed away by the enlarged liver. The recognition of this fact may save the unnecessary opening of the pleura. The right side measured 1 inch more than the left at the level of the xiphoid appendix. The whole of the hepatic area was tender, but the most tender spot was in the tenth interspace, 6 inches from the spine and 3½ inches above the tip of the twelfth rib. The abscess was opened on November 1st, 1883, after ascertaining the presence of pus with an aspirator near the tenderest spot, but rather lower down so as to be sure of avoiding the pleura. When I introduced my finger into the wound it felt as though there were no adhesions between the liver and the diaphragm, but the pus flowed freely, and there was no difficulty in replacing my finger by the tube; but when he awoke from the anæsthetic he was much collapsed, and complained of intense pain on the left side of the abdomen. In spite of opiates the pain and tenderness continued on the left side for three days. There was also a great deal of vomiting for a week, and much prostration, but in the meantime the discharge from the wound diminished, and remained quite free from smell under carbolic acid gauze dressings. The temperature on the third day reached 100.2°, but was for the rest of the first week normal. At the end of this time the bowels acted, the tongue cleaned, and he started on a rather tedious but complete recovery, only interrupted by a short attack of tonsillitis.

This case was slow because of the large amount of discharge, which was mostly serous and bile-stained, necessitating daily changing of dressings for more than three weeks. Then it somewhat rapidly diminished and the abscess had closed at about the end of the eighth week. The peculiarities of this case are: 1. That it is probable that a very little of the pus escaped into the peritoneum (though I am not quite sure of it) and set up a mild form of peritonitis, very likely quite local. 2. That in all probability a bile duct of some size leaked into the abscess, and so kept up the quantity of the discharge.

Tropical abscess of the liver is much less frequently met with in women than in men; which, considering that it appears to be distinctly due to climatic influences, being much more common, for example, in some parts of India than in others; and considering also that, though it sometimes occurs in the most temperate, it is often preceded by injudicious eating or drinking, is not to be wondered at. For the latter cause is certainly less likely to be present in women than in men, and the occupation of men naturally leads them more into places where they are exposed to malarial influences. It is, however, well known that people who have never been out of England may suffer from a hepatic abscess, not to be distinguished from tropical abscess, and that others who have been abroad years before, but have long resided in England, may be similarly affected.

CASE XIII.—I have met with one case in a lady. Mrs. E., aged about 30, went to India in January, 1888, and was married in November. She suffered from boils, dysentery, and hepatic congestion. The liver became much enlarged (four inches below the ribs) and very tender, and the temperature rose at times to 103°. I saw her in August, 1889, with Sir J. Fayrer and Dr. Mair. She was then very much emaciated and slightly jaundiced. The liver was large and tender, and there was marked prominence at the epigastrium, a sense of nausea being caused by manipulating the liver, which is a not very uncommon symptom. On August 24th some blood and, it was thought, some pus, had been passed from the bowel. I opened the abscess at the epigastric prominence, finding good adhesions. The abscess contained a very large quantity of pus. The dressings were of cyanide gauze. The liver, in a few days, came up under the margin of the ribs, leaving only an indefinite sense of resistance in the loin, the nature of which could never be ascertained. It ultimately completely disappeared, and the abscess was entirely healed, except a small superficial button of granulations, in a little over two months. The discharge, after the first week or ten days, was quite trifling, and she quickly put on flesh, but remained rather yellow after the abscess had closed.

CASE XIV.—Mr. G., aged about 30, was an example of a patient with hepatic abscess who had never left England. He was under the care of Sir Joseph Lister (who has given me leave to publish the case) in 1877. The abscess, which was small, pointed at the epigastrium, and was opened there. It was treated with carbolic acid gauze, and he made a good recovery in five or six weeks, interrupted only by a mild attack of erysipelas. Mr. G. is now alive and well.

An abscess of the liver may burst in several different directions: (1) through the abdominal or thoracic wall; (2) into the stomach; (3) into some part of the intestine; (4) into the pelvis of the right kidney; (5) into the lung; (6) into the right and perhaps into the left pleura; (7) into the pericardium; (8) into the peritoneum.

Let me here interpose a few words of anatomy. How different is the liver of to-day from the liver of our studentship! Then it was a flat body, with two plane or at most somewhat uneven surfaces, and a circumference, the latter being broad and thick behind, but thin in front and to the left. Now we recognise three well-marked surfaces, following the careful method of observation taught us by His; and we know exactly what fits into each of the numerous and well-marked impressions. As of old the upper surface is closely applied to the diaphragm, and for a very small space both the right and left lobes are in contact with the abdominal wall at the epigastrium; but we are able to make out a distinct impression close to the crossing of the suspensory and coronary ligaments corresponding to the under surface of the heart. The Spigelian lobe is banished to the posterior surface, and no longer bounds the foramen of Winslow, this function being fulfilled by the caudate lobe; but the Spigelian lobe rests against the bodies of the tenth and eleventh dorsal vertebræ and the right crus of the diaphragm and the aorta. Next, to the right, comes the vena cava in its special

fossa, while still further to the right is the space between the two layers of the right lateral ligament, which touches the diaphragm opposite the tenth and eleventh ribs and has a distinct little impression for the suprarenal capsule. Here, that is at the tenth interspace, we might puncture the liver without wounding the peritoneum, but not without traversing the pleura and the lung. The under surface of the left lobe has a beautifully curved surface corresponding to the upper half of the anterior surface of the stomach, including the pylorus, which should touch the neck of the gall bladder. Then comes the gall bladder in its own special fossa, and just to the right of its neck is a well-marked pit for the first part of the duodenum. Still further to the right are two obvious fossæ separated by a pretty sharp ridge; the anterior reaches the free border of the gland, and receives the hepatic flexure of the colon; the posterior reaches the posterior surface, and is occupied by the kidney.

The longest axis of the liver is directed from behind forwards and to the left. The lower border corresponds nearly with the margin of the ribs behind and as far forwards as the ninth right cartilage, and then it stretches across, ascending somewhat, to reach the left eighth cartilage. The upper limit is marked on the surface of the chest by a line drawn from the fifth right to the sixth left chondro-sternal articulation, but varies, as does the lower border, somewhat with inspiration and expiration. The right lung, however, lies in front of the liver as far down as the upper border of the sixth rib in the nipple line, and the heart as far down as the fifth interspace on the left side. It extends, as a rule, $1\frac{1}{2}$ to 2 inches to the left of the left border of the sternum.

The recognition of these facts is all-important in coming to an understanding of the method of rupture of a hepatic abscess.

1. I have already sufficiently explained the two most common situations in which a hepatic abscess may make its way *through the parietes of the body*—namely, either in the neighbourhood of the epigastrium or through a lower intercostal space, usually in the axilla. But it by no means follows that an abscess bursting externally may not have previously opened in some other direction. It should also be added that any abscess which has found its way amongst the planes of the abdominal wall may burrow between them to some distant situation, such, for example, as the umbilicus. Thus I may mention a case of abscess of the gall bladder, which pointed in the right lumbar region, from which situation gall stones were extracted.

Another puzzling case of a somewhat similar nature was CASE XV.—W. E. M., a civil engineer, aged 31. He went to India in September, 1879, and had good health till 1887, except for occasional and slight attacks of fever, the first of which was when he had been out only three months. He was twice laid up with boils, but had no dysentery and no hepatic trouble. He was almost a teetotaler. In April, 1887, he went to Burmah, had malarial fever in May, and was invalided in July. He returned to England and saw Sir Joseph Fayrer, who found the liver enlarged but no suspicion of abscess. He went back to Burmah in December, 1888. There was a strong history of tubercle in the family.

The report of Mr. Darwin, of Rangoon, says that he first came under observation in April, 1889, for an ulcer on the leg and bubo, the result of an abrasion through walking and riding. He had also an inflamed throat and fauces. He went to work in an unsatisfactory state of health, and had a few attacks of fever. In May he was still troubled with his throat; nothing was observed wrong with chest or liver. June 17th he had a stitch on the right side, and friction was heard at the base of the lung at the seat of pain. This was followed by a slight dullness at the right base and increase of the area over which friction sounds were heard. The temperature rose to 101° , and it was thought slight friction was heard on the left side. By the 23rd the temperature had come down to normal, and the only sign remaining was a little dullness at the right base. He was recommended for twelve months' leave. Between July 8th and 24th he was at the Rangoon Hospital, and was treated for hepatic pains, debility, and slight febrile symptoms.

On his return to England he consulted Dr. Lauder Brunton, who sent him on to me. I saw him on September 23rd, 1889. He was then in fair general health, walking about and feeding like anyone else. He had a prominent red swelling over the eighth right cartilage, evidently an abscess. There was a little enlargement of the liver downwards, but it was very slight, and there were no abnormal physical signs in the chest. It was agreed that the diagnosis was doubtful, but that it lay between tubercular disease of a costal cartilage and an abscess of the liver. I have described the course of the symptoms and the physical signs in some detail, so as to make

more clear the difficulty of coming to a definite diagnosis. The bowels were acting well, and the skin, though brown, could hardly be said to be jaundiced.

On the 25th I made an incision into this, and opened first a cavity in the subcutaneous tissues; then a small opening led down to another compartment beneath the edge of the rectus, at the bottom of which was the rib cartilage, exposed but not at all roughened. Round the lower border of this another track led into a cavity of much larger size, containing perhaps 4 ounces of pus, which was either in the substance of the liver or in the adhesions formed between it and the diaphragm and abdominal walls. It was very irregular in shape, and the interior was marked by pits and bands. In the pus were found a number—thirty to forty—of minute, flat, square bodies with rounded edges, hard and smooth, like small and curiously-shaped gall stones; they were found on examination to consist of cholesterine. A drainage tube was put in and the wound was dressed with cyanide of mercury gauze. The patient made a good recovery. For the first few days he was feeling perfectly well. Afterwards he had occasional slight rise of temperature up to 99° F., and a sensation as if a rigor might be impending. At these times also his appetite fell off. He left for Eastbourne on October 19th, and returned to see me on November 20th. There was then a spot an eighth of an inch across unhealed from which no discharge had come for several days, and into which a probe could not be introduced.

I have never seen such bodies as these described either in a gall bladder or a hepatic abscess, and the question must remain undetermined as to where they were formed, especially as the exact position of the abscess could not be decided when the finger was introduced, but I have little doubt that it was a genuine abscess of the liver, and that the bodies were not formed in the gall bladder. The difficulty of finding the track in this case was rather considerable, and it is therefore important as indicating the care that must be observed and the necessity for a free incision in abscesses which burst close to the margin of the ribs.

2. I have no experience of abscess *bursting into the stomach*; but we are assured by Indian surgeons that it is by no means uncommon for this method of evacuation to lead to a perfectly satisfactory cure.

3. On the other hand it is well recognised that for an abscess to *burst into the intestine* is not a very favourable, though by no means necessarily a fatal, condition. It will be remembered that in the case of the lady described above it is possible that this may have occurred, yet she made an excellent recovery, and this is quite consistent with the fact that a similar result sometimes happens when the same thing occurs when a basic pulmonary abscess, or an empyema follows the same course. The most common portions of the gut to be perforated are the transverse colon and the duodenum. It is important to recognise the characteristic white flocculent appearance which is presented by pus that has traversed any considerable length of the intestinal canal. It has quite a different look from pus recently evacuated from an abscess, and may readily be supposed to be some of the ingesta curiously altered in character. In the following case the abscess had opened into both these viscera.

CASE XVI.—Mr. G., aged about 34, a barrister from Bombay, came under the care of Dr. Stanley Smith, with whom I saw him on August 7th, 1888. Dr. James Arnott, of Bombay, reports that he saw him on June 1st, 1888, and found him suffering from severe pain just over the position of the gall bladder, and fever ranging from 99.5° to 102° . This lasted for a month, when the temperature fell, and continued apparently in the neighbourhood of 100° till he came under notice. The pain quickly subsided, but tenderness remained, and extended far back on the right side. The liver was considerably enlarged downwards, and percussion over it caused nausea and vomiting, which indeed were troublesome symptoms throughout. The tongue was always foul, and the bowels were kept open by means of purgatives. Dr. Arnott made the diagnosis of a hepatic abscess opening into the stomach or some part of the intestine, being, I presume, led to this opinion by the character of the vomiting. His general health improved on the voyage home, and the tongue cleaned, but by July 28th a distinct bulging had begun to show itself at the epigastrium, which, by the time he reached England, was undoubtedly a pointing hepatic abscess. On August 4th he had a severe rigor in the early morning, but at 10 A.M. the temperature was normal. He was thin, emaciated, and sallow, but not jaundiced nor very anæmic. His manner was remarkably lethargic. The liver reached the umbilicus, and pres-

sure over the tender prominence caused nausea. The bowels were constipated, the motions dark, the tongue clean, the pulse small, the skin moist, and he required a fire even on a hot August day.

I made a vertical incision about an inch and a half below the margin of the ribs, a little above the most prominent part of the swelling, that is, about the middle (from side to side) of the rectus, and, after dividing the abdominal wall, found no adhesions at the part of the liver exposed. I therefore separated the rectus from the posterior layer of its sheath, so as to expose a portion such as is shown in the sketch (Fig. 1). Then with Hage-

Fig. 1.

a. Subcutaneous fat.
b. Rectus.
c. Sheath of rectus.

d. Liver.
e. Interrupted suture.
f. Continuous suture.

dorn's needles, two rows of stitches were applied, the outer being interrupted and of silk (e), the inner continuous and of catgut (f). The needles went right into the liver substance, and the closure was, as far as could be ascertained, complete. But so near was the pus to the surface that, in introducing the needles, a drop or two of matter escaped at one or two points, which was carefully sponged away. I therefore thought it wisest to open the abscess at once, introducing a large drainage tube. An ounce or two of thick yellow pus, with a faint smell, escaped. I did not squeeze it nor introduce the finger. It was dressed first with unprepared gauze soaked in a 1 to 4,000 sublimate lotion, outside which was placed a mass of alembroth gauze. The operation took one hour and a half, but was well borne.

The patient never improved, however, after, but remained in a curious dazed lethargic state, taking all the food given to him, but without appetite. His temperature was usually subnormal, but for two or three days reached 99°, falling again afterwards. A few days after the first operation a fresh pointing took place rather lower down, and it was then ascertained that both this and the original opening communicated with a large cavity more deeply situated. Diarrhoea now set in, the motions being dark and containing sago-grain masses of mucus. He became gradually weaker, and died on August 15th, eight days after the original operation.

At the *post-mortem* examination we found the lower part of the liver, that is, the part at which the second opening was made, adherent to the abdominal wall by old adhesions, and that the adhesions formed by my stitches were complete and sufficient, but that there was no recent general peritonitis. The main abscess had three principal diverticula; two I have already described, the third reached the under surface of the liver and communicated with the first part of the duodenum and the transverse colon. Throughout the large intestine there was extensive, but apparently not very old, ulceration.

I think this is a very important case from two points of view: first, as showing that we cannot be certain, even when an abscess is actually almost pointing, that the liver will be found adherent; and, secondly, that, by careful stitching, perfectly sound adhesions

may be formed, and that there is no danger in proceeding at once to evacuate the matter. This is just what the experience of gastrotomies, colotomies, enterotomies, etc., would lead one to expect, and it is a useful piece of knowledge in connection with the question of opening putrid or other abscesses of the lung. Thirdly, it seems to show that the fouling of an abscess by a communication with the bowel is a dangerous condition, though I confess that the case is complicated by the presence of the ulceration of the intestine. The occurrence of diarrhoea, and especially if mucus be present, I regard as a point that should make us give the most grave prognosis.

ON THE CENTRAL MOTOR INNERVATION OF THE LARYNX.

BY PROFESSOR DR. H. KRAUSE,
Berlin.

IN an article under the above title,¹ Dr. Felix Semon and Mr Victor Horsley refer to a large series of experiments carried out on different species of animals in 1886 and 1887, as they say, "with a view of investigating the central motor innervation of the larynx." They continue to state that they have been prevented from completing their researches, but having been requested to publish their results, if only in a preliminary form, they wish to comply and to add the deductions which they think may be legitimately concluded from their experiments. They distinctly state that "their above mentioned article is only a preliminary communication, and that they will publish a full account shortly before the Royal Society and the International Medical Congress at Berlin."

Now as they say that their experiments were made "with a view of investigating the central motor innervation of the larynx," I deem it necessary to state that already, in 1883, I published my researches: "On the relations of the cerebral cortex to the larynx and pharynx."² The latter were concluded under request and direction of Professor H. Munk, who at the same time determined with absolute accuracy the area whence stimulation of the laryngeal muscles could be effected in accordance with the results of his researches on the localisation of the cerebral cortex. These results of mine the authors have on a former occasion, 1886, recognised as the first investigations on this subject. In my paper I have gathered—as far as I know with sufficient clearness—amongst others, the points which the authors in their "preliminary communication," assert to be the chief results of their own investigations. To prove the above assertion, I shall place in the following lines, *seriatim* and in juxtaposition, the deductions of the authors and the corresponding paragraphs of my own paper.

1. They find a motor centre in each cerebral hemisphere, situated in the monkey just posterior to the lower end of the precentral sulcus at the base of the third convolution, and in the carnivora in the precrucial and neighbouring gyrus.....that stimulation of this point produces complete bilateral adduction of the vocal cords.....and finally, that stimulation of the more peripheral parts of the area evokes "less and less perfect adductions as they proceed from the focus outwards, and when the extreme margin of the area is excited, only what is known as the 'cadaveric position' is assumed by the vocal cords."

With reference to these points, I extract the following passages:⁴ "The area to be stimulated is the gyrus præfrontalis (Owen)" (the animals used in each case being dogs). Again, all my experiments show that unilateral stimulation produces bilateral movements of the vocal cords. Not to leave any doubt, however, I shall quote the following experiment *verbatim* (page 206): "Experiments performed July 12th, 1882: Skull opened on the right side, and complete section of the left recurrent laryngeal nerve (during stimulation); movements of the right vocal cord are observed, which passes beyond the middle line approaching the

¹ JOURNAL, December 21st, 1889.

² Sitzungsberichte der Königlichen Academie der Wissenschaften und Archiv für Anatomie und Physiologie, 1883.

³ In regard to this point I think it justifiable to cite a passage from Jules Soury's work, *Des Fonctions du Cerveau*, etc. Paris, 1886, page 80, where he says: "La vérité est que ce travail de H. Krause, inspiré par les doctrines et expériences de Munk, est un modèle de solidité scientifique et d'élégante précision."

⁴ Loc. cit., p. 204.