found in the blood; these in turn are produced by some bodies formed in the gastro intestinal tract.

The altered growth of the flora of the stomach and intestine in certain nutrient media, as produced in the

Fig. 5.—Completely healed ulcer (stomach of dog).

feeding experiments, indicates the important factors in the formation of ulcer of the stomach or duodenum, and the relation to other pathological conditions frequently associated with the lesions.

A CASE OF REPEATED ABDOMINAL SECTION FOR PERFORATION OF GASTRIC ULCERS.

By W. MORLEY WILLIS, F.R.C.S.,

HONORARY ASSISTANT SURGEON, GENERAL HOSPITAL; SURGEON,
CHILDREN'S HOSPITAL, NOTTINGHAM.

THE paper by Mr. Archibald Cuff, of Sheffield, in the BRITISH MEDICAL JOURNAL of February 2nd, much interested me on account of its close similarity to the following case of my own:

History.

A. H., aged 33, suffered from pain after food about the age of 18, and the first definite fact beyond this which I can ascertain is that he was admitted into the General Hospital, Nottingham, with an attack of haemorrhage from the stomach about fifteen years ago. He remained in the hospital one month. He suffered, more or less, with pain after food ever since, until on December 31st, 1905, at about 5 a.m., he was seized with intense abdominal pain. His supper overnight had consisted only of a little warm milk. I saw him with Dr. Fulton at about 1 p.m. the same day, and he was removed to the hospital.

First Operation.

At the operation (about 3 p.m.) I found a large ulcer in the cardiac end of the stomach, nearer the greater curvature, with a perforation in it about the size of a threepenny-piece. This was closed by a double row of continuous silk sutures, which invaginated the ulcer completely. The peritoneum was wiped out, and his recovery was uneventful. He left the hospital well, except for some oedema of his lower extremities.

Second Operation.

On October 2nd, 1906, at about 6 p.m., I was again asked by Dr. Fulton to see this man, and agreed with him that he had a perforated ulcer of the stomach. He was again admitted to the General Hospital, and I reopened the abdomen about 9 p.m. An entirely different ulcer was found this time, at the pylorus, with a small perforation at its base. This was closed in the same way as the former, and the peritoneum wiped out dry and the abdomen closed. At both this and the former operation the abdomen was completely closed.

At this second operation I carefully inspected the stomach, especially that part which was the site of the previous ulcer. No trace of it remained, and not an adhesion was left to indicate the catastrophe which had taken place in 1905. This removal of all traces of former pathological changes inside the peritoneum is remarkable, and

has been commented on frequently. In cases of suppurative appendicitis, when at the operation the appendix is not discovered, it is my habit to advise the subsequent removal of the organ. I therefore have on many occasions opened the abdomen of patients who have been the subjects of intense inflammation in this neighbourhood, and the frequency with which one discovers an apparently perfectly undamaged peritoneum is most remarkable.

As regards the patient about whom I am now writing, I am informed that he is perfectly well except for some slight oedema of his left leg. He is able to eat any article of food without pain, so I expect he will not take my advice and have a posterior gastro-jejunostomy performed on him.

Success in dealing with perforated gastric ulcers depends almost entirely upon the period which elapses between the catastrophe occurring and the operation, and to Dr. Fulton is due the recovery of this patient, as immediately he saw him he took steps to ensure instant operation. The interval between the perforation of the first ulcer and the operation was about eighteen hours, in the second case eight hours. In both cases only about two or three hours elapsed between his first being seen and the operation itself.

A CASE OF CELLULITIS

FOLLOWING INFECTION BY AN ORGANISM SET FREE BY
THE WOUNDING OF AN OLD BLIND DIVERTICULUM
OF THE LARGE INTESTINE.

By G. H. MAKINS, C.B., F.R.C.S.,
SURGEON, ST. THOMAS'S HOSPITAL.

THE discrimination of cases of cellulitis into varieties corresponding with the causative organism is of much importance both with regard to prognosis and treatment, and of late years much progress has been made in this direction.

The case related below appears to warrant the assumption that it is an example of a rare infection possessing distinct and characteristic features. It was at first assumed to be an ordinary infection by the *Bacillus coli communis*, until the entire absence of gas formation as a part of the process was noted. This clinical fact was later fully substantiated by the results of cultural experiments made with the organism, which showed the bacillus to be both clinically and in cultural characters distinct from *Bacillus coli communis*.

The original development of the organism in a portion of the large intestine excluded from the rest of the alimentary canal is of interest as possibly explaining its presence and peculiarities, since it appears to be of the same nature as certain organisms cultivated from faeces by Houston.

History.

A. B., a seamstress, aged 35, had undergone inguinal colotomy fifteen years ago, in order to exclude a sinus into the rectum which had resulted from a former operation for the removal of diseased Fallopian tubes, which plastic operations had failed to cure. The artificial anus established at that time worked well, it was of small and convenient size, the bowels acted once daily, there was never any prolapse, the faeces were readily controlled by apparatus, and the patient followed her occupation without any disadvantage.

Eight months ago, however, a sudden attack of intestinal obstruction occurred, the patient was admitted into the hospital, and it being assumed that contraction of the artificial anus was the cause of the trouble, the latter was dilated, and after this the bowels again acted freely.

Two days ago the patient took a dose of castor oil, which was followed by a free evacuation, but last night she was seized with sudden pain in the lower abdomen, and since then she has vomited frequently and neither faeces nor flatus have been passed.

Condition on Admission.

The patient complained of acute pain and was vomiting frequently. The tongue was clean, pulse 120, temperature normal.

On inspection the abdomen was flat and not distended nor tender, the colotomy opening admitted the forefinger, the colon appeared empty, and this corresponded with the negative result of an enema given in the morning. The scars corresponding to the old fistula and the operations for its attempted closure were sound; beneath the centre one some hard masses, about the size of a walnut, seemed to indicate the presence of old faecal lumps.

Operation.

A diagnosis of acute obstruction from adhesions was made, and the abdomen opened near the middle line by displacement of the left rectus muscle. Collapsed small intestine was seen, and when traced upwards was found to lead to a tight adhesion of the lower part of the jejunum in the pelvis. The incision needed to be carried somewhat more downwards to give access to the affected coil, and during this procedure it is believed the old sinus was wounded and laid in connexion with the incision.

After-History.

The result of this operation was satisfactory as far as the obstruction was concerned; on the third day the bowels were opened freely by enema, and the pulse and temperature only showed slight occasional variations from the normal.

On the eighth day the temperature rose to 101° and the pulse to 112, and when the dressings were removed to take out the stitches it was found that the wound was suppurating. The pus evacuated was of a dark dirty-brown colour and of such strong faecal odour that the house-surgeon assumed the development of a faecal fistula. Hot boracic-acid dressings were applied.

During the next two days a spreading cellulitis developed towards the right groin, the skin assuming a red marbled aspect, and on the sixteenth day an abscess was opened just within the right anterior superior spine of the ilium.

The incision had no effect in staying the extension of the cellulitis; superficial oedema steadily spread downwards in the right thigh and into the adductor region, the surface of the limb assuming the same red marbled aspect that had been noted at the commencement of the process. Other incisions were made in the adductor region, and on the thirteenth day a number of incisions were made over the front and inner aspect of the upper four-fifths of the thigh.

The condition revealed by these incisions was remarkable, as in the previous wounds, a very large amount of the subcutaneous tissues was gangrenous and sloughing, while the pus was of the same dark, dirty-brown colour, extremely foul-smelling, to all appearances resembling fluid faeces. The superficial network of veins was completely thrombosed, while the individual vessels were dissected out by the process of sloughing of the supporting tissues, and still retained the normal dark colour of coagulated venous blood. The connexions with the deep veins were also thrombosed, but there was no evidence of extension of the process into the deep veins themselves, since the foot and leg and also the outer aspect of the thigh throughout remained free from oedema. The remarkable marbling of the surface appeared to be dependent on this condition of the veins.

One week later an apparently superficial bleb formed just behind the inner hamstring tendons, and from this again there was a free flow of discharge, which the Sister of the ward described as faeces. This marked the lowest point reached by the process.

During the extension downwards of the cellulitis a striking change took place in the tissues earliest affected—the sloughs were thrown off, and the dirty-brown pus was replaced by thick yellow inodorous pus. The wounds were dressed every four hours with warm boracic fomentations, and on each occasion syringed with a solution of hydrogen peroxide. It should be mentioned that in addition to the multiple incisions made by the knife, a number of small, almost pinhole, spontaneous openings were formed, a small black slough separating at each spot, apparently corresponding to a thrombosed vessel.

The process gradually worked itself out, until during the fifth week the wounds had almost ceased to discharge, when it was discovered that a large deep abscess had formed in the adductor region, and was pointing at the back. This abscess was covered by normal skin, and proved, as was expected, to contain thick yellow pus similar to that which had before superseded the brown pus in the other wounds. No gas formation was observed at any time.

A cultivation made from one of the fresh wounds was reported from the clinical laboratory as consisting of an experimentally non-pathogenic bacillus, which was agglutinated with the patient's own blood serum. It was determined to treat the patient with a vaccine prepared from the organism, but when the opsonic index was taken it was found to be 3.2, hence although the vaccine was being prepared, the idea was given up in view of the degree of resistance exhibited by the patient to the organism, and the obvious fact that she was rapidly improving.

The general condition of the patient during the progress of these local phenomena may be disposed of in a few words. She looked very ill, slept badly or not at all, had little appetite, a very dirty tongue, the temperature ranged from normal to 102° , with a fairly regular evening rise, and the pulse averaged 100.

The abdominal condition remained satisfactory, and the patient—a plucky, hopeful woman—made the least of her troubles. After the opening of the last of the abscesses she rapidly regained strength, put on flesh, and made rapid progress towards recovery. She has now completely recovered, and at the end of three months has resumed her occupation.

The case seems worthy of record in that I have never before observed a similar cellulitis, the prominent features

being the remarkable dark-red marbling of the skin, unaccompanied (as was first expected) by any gaseous emphysema, the extensive venous thrombosis, the steady progress of the infection in a contrary direction to that of the lymph stream, the strict limitation of the process to the subcutaneous tissue, the widespread sloughing of the connective tissue infected, and, lastly, the strong similarity of the discharge in odour, colour, and consistence to liquid faeces.

These peculiarities were no doubt due to the infecting organism, possibly modified in its nature by the seat of its initial growth in small masses of faecal matter contained and retained in an old blind diverticulum of the large intestine.

Other remarkable features existed in the comparative moderate nature of the general symptoms considering the extent of the area of the body affected, and the length of time during which the process of extension continued.

It is clear that at an early date the patient developed a very high degree of resistance to the organism, as shown by the opsonic index of 3.2 obtained at the end of the third week, which, taken with the fact that at that time she was rapidly improving, seemed to render the trial of any vaccine superfluous. Again, the limitation of the thrombosis to the superficial veins was both fortunate and striking. It is evident that the clotting depended solely on direct extension of the inflammation from the supporting tissue to the venous wall, and there seemed no tendency of the clotting to spread by continuity in the blood-stream into the parts beneath the deep fascia of the limb where the connective tissue remained unaffected by the process proper. To this fact the patient was no doubt indebted for the absence of anything like the detachment of fragments of clot and the dispatch of septic emboli to other parts of the body.

Other points seem to contraindicate a very high degree of virulence in the organism and its products, thus, the comparatively slow and quiet initial development of the cellulitis, and the tendency of the process to work itself out with some rapidity.

I am much indebted to Mr. Dudgeon and Dr. Pantton for the trouble they took in the determination of the organism concerned, and to Mr. Dudgeon for the following details regarding the same.

The bacillus isolated from the pus of the wounds in the abdominal wall and the thigh presented morphological and cultural properties as follows:

It was a small rod-shaped bacillus with rounded extremities, and definitely motile. It failed to retain Gram's stain. It formed dark blue colonies on the medium of Drigalski and Conradi, decolorized neutral red broth (anaerobically) without producing any definite green fluorescence, acidified litmus glucose, lactose, maltose, mannite, salicin, saccharose, without the production of gas, while litmus glycerine, erythrite, and sorbit remained unaffected. Litmus milk was rapidly acidified, clotted, and peptonized. Gelatine media were completely liquefied. There was an absence of indol formation.

A young agar culture was emulsified with normal saline, and $1\frac{1}{2}$ c.cm. of the emulsion was injected intraperitoneally into a guinea-pig without producing any effect. The animal was killed fourteen days later and was found to be quite healthy, while cultures made from the spleen remained sterile.

The patient's serum produced a marked agglutination reaction with the bacillus in a dilution of 1 in 20, a fair reaction with a dilution of 1 in 50, and a very slight reaction with 1 in 100. Normal serum failed to produce any effect on the bacillus.

The opsonic index was tested during the latter part of the patient's illness and was found to be very high—3.2.

The most interesting feature in connexion with this organism was that, though it was proved beyond question to be pathogenic to the patient, yet it failed to have any effect on a healthy guinea-pig. It is, of course, a well-known fact at the present day that micro-organisms which are pathogenic to man may be found to produce no effect when injected into animals.

THE late Mr. James Hodge, of Manchester, who died on February 6th, left £500 each to Manchester Infirmary and Montrose Infirmary, and £250 each to the Manchester Southern Hospital and the Northern Counties Hospital for Incurables.