gastric ulcer operated upon at the earliest possible moment. Not so in perforation of the appendix, where the infectivity of the extravasating fluid is of tenfold virulence. Cases are frequently seen perforated eight, ten, and twelve hours after operation is arranged for. The profession as a whole has yet to grasp the importance of this aspect of acute disease of the appendix, and if such urgency is demanded in adults, it is the *sine qua non* for successful treatment in children, for here the margin of safety narrows down almost to the vanishing point. Here is a case of a child from the records of the Ulster Hospital, in which, in spite of the rapidity with which operation was carried out after the patient had been seen, at the operation, and at the subsequent *post-mortem* examination, pints and pints of purulent fluid were found within the peritoneum:

No. 35, M. B., aged 12, on being seen by Dr. Martin was sent straight to hospital, on the third day of the illness, after having been perforated apparently about twelve hours. There was a typical history of acute appendicular obstruction. Operation was immediately carried out—Dr. Elizabeth Robb administering open ether. On opening the abdomen a very large escape of purulent contents took place. A tube was quickly placed in the iliac fossa, and a second tube in Douglas's pouch, and the abdomen closed. The patient died about eighteen hours later. A *post-mortem* examination was kindly undertaken for me by Dr. Robb. In spite of the enormous quantities of pus which had escaped at the time of the operation, Dr. Robb told me that pints of pus seemed to escape on the *post-mortem* table. The appendix itself was gangrenous, and showed a very large, ragged perforation.

If no time should be lost after the onset of peritonitis how much more valuable will it be to operate before perforation! All arguments in favour of early operation in cases of true acute appendicitis are applicable to cases of acute appendicular obstruction, with this difference—that delay until perforation occurs, in the latter case often spells death. Therefore, the question now arises, Is it possible to diagnose these cases during the second day? I cannot help inserting here a statement made by Mr. Arthur Burgess in a paper he published in 1908, in which he reviewed the result of 500 consecutive cases of appendicitis. He says:

I feel strongly that fewer cases would pass unrecognized in their earlier stages were it to become the universal rule never to take a temperature nor count a pulse in a suspected case of acute appendicitis. They are only too apt to mislead.

What, then, are the points that we depend upon for our diagnosis on the second day? (1) The history of a sudden severe intermittent pain referred to the region of the umbilicus; (2) vomiting, rarely persistent and never faecal; (3) constipation; (4) some muscular rigidity on the right side; (5) dirty tongue and fetid breath. These occurring during the day after the onset of the pain are strongly suggestive of a gangrenous appendix, and therefore of the need for immediate operation. Endless almost are the arguments in favour of operating in the absence of pus, but I would mention the following:

Out of a series of 500 consecutive cases operated upon by the several members of the staff of the Royal Victoria Hospital and reported by Mr. A. B. Mitchell, although there was a total mortality of 15 per cent., there was not a single death in a non-purulent case, and this is my own experience in some 80 appendicectomies.

Prognosis.

As to the prognosis of these obstructive cases, they include, as Mr. Campbell has stated, all the rapidly fatal cases. The mortality-rate, therefore, cannot but be high if perforation be allowed to occur, but it will depend upon the following factors: First, and most important of all, the time of the operation. Let us get these cases before perforation occurs, and therefore before pus develops, and we shall be rid for ever of our ghastly figures for appendix operations. It will, from what I have said, be readily agreed that the ideal time for operation will probably be on the second day, though one could have no objection to operating earlier. These cases do not fall like thunderbolts—there is a margin of safety, but it is limited to the first twenty-four hours. By no other precautionary measures that I am aware of can we attain our ideal in the treatment of this disease. Looking at the list in your hands, it is very striking how the fatal cases occur at the foot of each series. With operation on the second day

I see no reason why the mortality-rate should be other than infinitesimal. After perforation many other factors will influence the prognosis—such as the type of the disease, the presence of adhesions, the size of the perforation, the diet of the patient, the age of the patient, the amount of disturbance to which the patient has submitted after perforation has occurred, the skill, speed, and technique of the operator, the judicious use of the drainage tube, the employment of open ether only as the anaesthetic, the subsequent management of the case by the adoption of the Fowler position, with proctoclysis, and, if necessary, the hypodermic injection of pituitrin.

Conclusion.

In conclusion: (1) Acute diseases of the appendix may be divided into two classes—acute appendicitis and acute appendicular obstruction. (2) To the latter class belong most of the tragedies of abdominal surgery. (3) Safety only lies in the way of early operation—that is, before perforative peritonitis has supervened upon distension and gangrene of the appendix. Lastly, what of the third day in acute diseases of the appendix? Let us blot it out altogether, and rename it the first day—after operation!

AUTOGENOUS LIVING VACCINE IN THE TREATMENT OF ENTERIC FEVER.

WITH NOTES OF SIX CASES.

(PRELIMINARY OBSERVATIONS.)

BY

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HAVING recently treated cases of enteric fever with vaccine and obtained satisfactory results, it occurred to one of us (S. R.) that better results might be obtained by employing autogenous living vaccine for each case. The clinical notes and temperature charts of our first successive cases treated by this method and the satisfactory results obtained will, we hope, lead to this method being given a more extensive trial. Our cases have demonstrated that this method of injecting living bacilli in suitable doses is perfectly safe. The vaccine was injected subcutaneously—as a rule in the pectoral region—and was followed by very slight local reaction, but marked general reaction. No local or general complications were observed. The injection, as a rule, was followed by a rise in temperature within the first few hours, followed by a marked fall within twenty-four hours of inoculation. Careful notes were made, and in our minds there is no doubt that this treatment had a beneficial effect and tended to cut short the duration of the disease. It promotes perspiration, the aspect of the patient undoubtedly becomes brighter after injection, and the tongue becomes much cleaner.

The diagnosis was verified in all cases by blood culture. Several of the cases on admission to hospital gave the impression that the attack would be severe; in this opinion our consulting physician, Sir Wilmot Herringham, agreed. To him, also, we are indebted for valuable suggestions as to dosage, and frequency of administration of the vaccine.

Preparation of the Vaccine.

The disease was in each case diagnosed by means of blood culture. For this purpose 5 c.cm. of blood was drawn from the arm and immediately transferred to 1 per cent. sodium taurocholate. From this a broth culture was prepared, and the purity and identity of the growth verified by agglutination and sugar fermentation tests. The broth culture was reinoculated into fresh broth every day and itself constituted the vaccine. No further preparation whatever was employed. The age of the culture used was generally eighteen hours, and the number of bacilli contained in it was obtained by a direct method of counting which has been previously described by one of

us. The average number of organisms ranged from 60 million to 300 million.

Effects of Inoculation.

The local reaction following the injections was surprisingly small, and was far less than is commonly seen after a prophylactic inoculation, using a killed vaccine. The general reaction on the patient was, on the other hand, very marked. A sharp rise of temperature was always observed. Frequently this was accompanied by profuse perspiration.

These preliminary observations have demonstrated that a living culture of the typhoid bacillus can be injected subcutaneously into enteric patients, not only without any deleterious effects whatever; but, as far as the few cases show, with decided favourable influence on the course of the disease.

Much remains to be worked out. The dose and spacing of the dose will require many further cases to determine. In conclusion, it is desired to draw attention to the point of view that has dominated these experiments. The vaccine treatment of enteric has many advocates. It is the common experience of bacteriologists that all antigens are very delicate substances, and any physical agency employed to kill the enveloping bacillus acts deleteriously on the contained antigen. If, therefore, the vaccine treatment of enteric is of use when employing a killed vaccine, it should be of still greater use when a living vaccine is used. More especially will this be the case if the vaccine is autogenous. It has been the work of one of us during the last few years to investigate the antigens of the plague bacillus. In the case of this organism it has been found that the strain of organism used for the preparation of an antigen is most important. In the cases related, the strain used was in each case the strain isolated from the patient. It is hoped that these investigations will be continued by others.

CASES.

Case 1.—Private G. M., Royal Welsh Fusiliers, 23 years. Never been inoculated for enteric.

November 27th. Headache and feeling out of sorts.

November 29th. Had to fall out on parade and report sick.

Case 1.—*Autogenous vaccine injected.

December 2nd. Admitted to hospital. On examination patient tired and listless, pupils large, tongue dry, glazed, brown fur, tremors; considerable cough. Slight expectoration; breath fetid. Abdomen, no tumidity or tenderness; reflexes dim. A few spots. Marked diarrhoea, with occasional vomiting after milk. Spleen enlarged; knee-jerks exaggerated; chest breathing, harsh moist râles, no dullness. Promised to be a moderately severe case.

December 3rd. Blood culture positive.

December 5th. Abdomen more tumid, spots gone; 12 (noon). 0.25 c.cm. vaccine; evening temperature 103°.

December 6th. Slight local reaction, now almost gone. Temperature 100° F., looks flushed, complains of headache; abdomen tender, more spots.

December 8th. Feeling better, sleeps well; vaccine 0.25 c.cm.

December 11th. 8 a.m.: Temperature 98°, 0.25 c.cm. vaccine. 6 p.m.: Temperature normal.

December 12th. Considerable local reaction; temperature 97.4°. General condition excellent; was able to read newspapers.

December 18th. Temperature normal; general condition excellent. Got up for two hours. Was a bit weak on his legs. Convalescent.

Case 2.—Sergeant C., 2nd Royal Irish, 25 years. Never been inoculated.

December 20th. Admitted to hospital. Headache and general malaise. No definite symptoms. Drowsy, face flushed, tongue moist, light brown fur, abdomen slightly distended and tympanitic, numerous rose spots.

December 23rd. Blood culture positive. Spleen enlarged. Slight local reaction from auto-vaccine. Patient drowsy, and does not feel so well. Vaccine 0.25 c.cm.

December 24th. Patient feels very well, and is much brighter. During the night has perspired freely.

December 27th. 0.25 c.cm. vaccine; 5 p.m., complains of severe pain in left iliac fossa, which he states has been coming on ever since he was inoculated. No signs suggesting any complications. Same night, 1 c.cm. omuopon.

December 28th. Patient had had a good night. Abdominal pain all gone. Feels well. New patch of rose spots. Tongue still coated and tremulous.

Case 2.—*Autogenous vaccine injected.

December 31st. Vaccine 0.25 c.cm.

January 1st. Moderate local reaction. Temperature dropped considerably. Patient had a good night, and is in good spirits. Perspired freely.

January 4th. Vaccine 0.25 c.cm.

January 5th. More local reaction than usual, but not as much as is usual after a prophylactic dose of Wright. Did not sleep so well and perspired freely. Seems better this morning. Says he feels very well, tongue clean, no abdominal signs or symptoms.

From this date convalescent. Discharged to base, January 7th, 1915.

Case 3.—Sergeant A., A.S.C., 30 years.

December 7th. Sudden attack of cold shivering and malaise. Pains in back and headache.

Admitted to hospital on December 14th. Temperature 101.4°. Tongue, thick white fur, turning brown. The patient is bright and talks well. Chest, increased resonance and vocal fremitus over middle lobe of right lung. Heart, increased second aortic. Abdomen, no pain or gurgling. Rose spots. Constipated.

December 15th. Blood culture positive.

December 17th. 8 a.m.: Temperature 101°. Autogenous vaccine, 0.5 c.cm. 6 p.m.: Temperature 103.8°.

December 18th. 8 a.m.: Temperature 101°. One more spot.

December 21st. Temperature has continued about 102°. Patient seems bright. Vaccine 0.5 c.cm.

December 22nd. No local reaction, slight general reaction. Temperature and restlessness.

December 24th. Fairly comfortable. Tongue clearing up. Since vaccination has perspired very freely.

December 25th. Vaccine 0.25 c.cm.

December 26th. No local reaction, patient cheerful, and says he feels better.

December 29th. Vaccine 0.25 c.cm.

December 30th. Had an excellent night. Very slight local reaction, tongue moist and clean, wants to get up.

January 1st. Patient feels perfectly fit. Temperature normal, tongue clean, no abdominal symptoms.

January 2nd. Convalescent.

Case 3.—*Autogenous vaccine injected.

Case 4.—Driver F. B., A.S.C., 30 years.

November 22nd. Began to feel out of sorts. Headache and malaise.

November 25th. Admitted to hospital; was flushed, tired, and

restless. Severe headache and pain in back and legs. Appearance of being a severe case with coexistent bronchitis. Spat up a little blood, perspires freely, and complains of thirst. Eyes sunken, tongue tremulous, breath fetid. Tongue coated with dry white fur; has not vomited or bled from nose. Rest-

December 14th. Admitted to hospital. Temperature 104°. Looks dull and listless, tongue dry, brown fur, tremulous. Slight bronchial catarrh. Promises to be a severe case, with marked chest symptoms.

December 15th. Blood culture positive.

December 17th. 8 a.m.: Temperature 102°; 0.5 c.cm. autogenous vaccine. 6 p.m.: Temperature 102.4°.

December 18th. Temperature 102.8°.

December 21st. Temperature 100.4°; 0.5 c.cm. vaccine. Bright and cheerful. Still has some chest symptoms.

December 22nd. Had a good night, feels very well this morning. Slight local reaction.

December 25th. Vaccine 0.5 c.cm. Slight local reaction.

December 30th. Feels perfectly well, and is clamouring for food; wants to get up. Temperature normal. Tongue moist and quite clean, no abdominal symptoms.

December 31st. Convalescent.

NOTE.—In the above cases 1 c.cm. vaccine contains 400 million bacilli.

Case 4.—*Autogenous vaccine injected.

less, with a tendency to delirium and sleeplessness. Heart sounds normal pulse 108 and soft, temperature 105°. Spleen not enlarged. No pain or distension in abdomen or caecal gurgling. No rose spots. Blood culture positive.

November 27th. Temperature falling (102° at 6 p.m.). Diarrhoea had commenced 7 a.m.; 0.5 c.cm. autogenous vaccine into left arm. 8 p.m.: Temperature 103.8°, pulse 94. 12 (midnight): Temperature 101.2°, pulse 104.

November 28th. 7 a.m.: Temperature 102.2°, pulse 104. 8 a.m.: Temperature 103°, pulse 92, condition much the same, very slight local reaction.

November 29th. Did not sleep, some delirium, does not seem so well, urinary incontinence.

November 30th. Temperature same, feeling brighter, and had a good night.

December 2nd. Temperature falling to 99.2°, condition improved. 12 (noon): 0.5 c.cm. vaccine. 2 p.m.: Temperature 102°. 6 p.m.: Temperature 99.2°.

December 3rd. Slight local reaction, condition improved, still rather thick in the head.

December 4th. Very heavy and dull. Tongue tremulous; still has a bad cough.

December 6th. 8 a.m.: Temperature normal, greatly improved, tongue cleaner and less tremulous, no further involuntary passage of water or stools.

December 7th. 8 a.m.: Temperature 99°; has not passed water since last night; pain over bladder, which is distended; hot fomentations no effect; catheter passed; 2.5 pints urine drawn off. 3 p.m.: Temperature 102.6°, 0.75 c.cm. vaccine. 6 p.m.: Temperature 103.8°.

December 8th. Temperature 102°, marked reaction after vaccine, no local reaction. Though temperature went up, pulse remained the same. He had a restless night, but has not wandered in mind.

December 9th. 8 a.m.: Temperature normal, slept well and marked improvement, bowels open naturally, still being catheterized. Has an old stricture, which always gives trouble when he is ill.

December 10th. Seems tired, but sleeps well.

December 11th. Feeling better. Tongue steady, urine clear, no signs of cystitis. 8 p.m.: Temperature 103°.

December 12th. 8 a.m.: Temperature 99°; 0.75 c.cm. vaccine. No symptoms to account for temperature. Complained of feeling cold, but had no rigor. 6 p.m.: Temperature 101.2°.

December 13th. 8 a.m.: Temperature normal; feels distinctly brighter and talks; still unable to pass water. Since this his temperature has remained about normal, with the exception of a rise on the 18th, after some solid food.

Case 5.—*Autogenous vaccine injected.

Case 5.—Private D., A.S.C., 25 years.

December 10th. Felt ill with headache, pains in shoulders and back. Reported sick December 12th. Pains gone. Pain now in stomach.

Case 6.—Private A. S., 1st Lincoln, 19 years. December 23rd. Reported sick, with bad headache, pain in stomach, and diarrhoea. Diarrhoea has already lasted a week.

December 26th. Complaints of headache, diarrhoea, and malaise. Tongue moist and covered with white fur. Breath fetid. Vomited a few times before admission.

December 27th. Very drowsy and listless, unable to sleep, no appetite, abdomen distended and tympanitic. Tenderness over left iliac region, and tenderness and distension over splenic area. Splenic dullness not enlarged. Few rose spots. Blood culture positive; paratyphus B.

December 28th. Had a restless night, still drowsy, and cannot be persuaded to take an interest in anything; one fresh spot.

December 29th. Seems a little better. Still restless, and sleeps badly. Given 0.1 c.cm. autogenous vaccine (60 million). Blood count, 8,000. Considerable local reaction. Had a better night.

December 30th. Distinctly brighter. Tongue quite clean, and not tremulous; still some local reaction. Typical enteric stools.

December 31st. 11 a.m.: Autogenous vaccine, 0.1 c.cm. By 6 p.m. some local reaction.

Case 6.—*Autogenous vaccine injected.

January 1st. Patient feels a little better. There is still some abdominal tenderness and a fresh crop of rose spots has appeared. Diarrhoea has ceased.

January 4th. Patient looks well, and feels much better. Abdominal tenderness and distension has disappeared. Tongue cleaner, and not tremulous.

January 6th. Temperature down, but unsteady; 0.1 c.cm. vaccine given.

January 7th. Patient has had a poor night. Considerable local reaction, but he seems bright this morning.

January 8th. Patient much improved. Tongue almost clean. No abdominal symptoms. Temperature dropping.

January 9th. Temperature normal. From this date patient convalesced rapidly.

THE Paris Société de Médecine has decided to expel all German and Austro-Hungarian members who have not expressly repudiated the manifesto of the German professors.

THE first Friday evening discourse at the Royal Institution of Great Britain after Easter will be given by Mr. Stephen Graham on April 16th; his subject will be "The Russian Idea." On April 23rd Major P. S. Lelean, R.A.M.C., will speak on military hygiene at the war; on April 30th Professor Donnan, F.R.S., will give an experimental lecture on emulsion and emulsification; on May 7th Professor O. W. Richardson, F.R.S., will give a similar lecture on electrons and heat; on May 21st Mr. Edward Heron-Allen will lecture on beauty, design, and purpose in the foraminifera, and on June 4th Professor Sir Ernest Rutherford will discourse on radiations from exploding atoms.