lastly, to persons who are living in any district which is being visited by an epidemic of typhoid.

In conclusion, we desire to state that we have a certain amount of typhoid vaccines which we shall be glad to place at the disposal of any practitioner who may desire to undertake these vaccinations.

REFERENCES.

¹ *Deut. med. Wochschr.*, November 18th, 1896. ² Comparative experiments on monkeys inoculated with dead and living cultures of Malta fever have led us to believe that dead cultures in suitable doses give quite as effectual an immunity as living cultures. ³ *BRITISH MEDICAL JOURNAL*, February 4th, 1893. ⁴ This decrease of blood coagulability appears to be one of the most common effects of the introduction of a bacterial poison into the system. It becomes especially notable whenever there is already a natural defect of blood coagulability, especially if in such cases no provision has been made for forestalling this blood change. Instances in point are Cases 1 and 2 (*vide* Table of Results) where there was a natural defect of blood coagulability, and where calcium chloride was not administered along with the inoculation. Further, Cases 4 and 11, in which, although there was no natural defect of blood coagulability, the administration of calcium chloride was deferred till after an interval of 3 to 5 hours. In the last three cases blood coagulability decreased respectively from 7 minutes to 11 minutes, from 3½ minutes to 5½ minutes, and from 4 minutes to 11 minutes under the influence of a typhoid vaccination. Under the influence of calcium chloride blood coagulability was in these cases brought up in a very few hours from 9 minutes to 5½ minutes, from 5½ minutes to 3 minutes, and from 11 minutes to 5 minutes respectively. ⁵ That local oedema is often dependent upon a defect of blood coagulability, and that it can be corrected by the administration of calcium chloride is a proposition which has been established by one of us in a series of papers dealing with serous hæmorrhage in general, and with urticaria and chilblains in particular. These papers were published in the *Lancet* of January 18th, 1896; September 19th, 1896; and January 23rd, 1897; and in the *Journal of Dermatology*, February, 1896; and January 1897, and in the *Journal of Dermatology*, February, 1896. ⁶ *BRITISH MEDICAL JOURNAL*, January 16th, 1897, p. 139. ⁷ This, it may be noted, is in harmony with the fact that Pfeiffer has succeeded in cultivating cholera vibrios upon a goat's serum which exerted a sedimenting influence in much more than a 200-fold dilution. ⁸ It may be noted in passing that, so far as our observations go—and here, again, they are in harmony with those of Pfeiffer—the sedimentation power which is acquired by undergoing an attack of actual typhoid is not greater than that which is acquired by an inoculation of dead typhoid bacilli. ⁹ We have verified that there is no appreciable difference with respect to sedimentation power between the plasma and serum of a man who has received an inoculation of dead typhoid bacilli. ¹⁰ We have, however, arranged to be supplied from time to time with samples of blood from each of our vaccination patients, in order to investigate the question. ¹¹ *Vide* Note 8. ¹² The advantage of such a control will be obvious if we consider that Cases 13, after first vaccination, and 16, after second vaccination (*vide* table of vaccination cases) proved on examination to have acquired only a very small amount of sedimentation power. This fact could not have been suspected in Case 13, for this patient showed a very marked clinical reaction.

FOUR CASES OF ENTERIC FEVER TREATED WITH ANTITOXIC SERUM.

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As few instances of the treatment of typhoid fever by antitoxic serum have as yet been published, the following details of four cases treated in the Leicester Infirmary may be valuable. The only selection that was made as to the cases in which the serum was used was that it was thought inadvisable to administer it to cases in a later stage than the end of the second week, as otherwise natural defervescence and that due to the remedy might have been confused.

The serum used was that prepared by Mr. T. J. Bokenham, and was obtained from Messrs. Burroughs and Wellcome. The injections were mostly made in the loins, and antiseptics was carefully observed. For the thorough manner in which this was done, for care in the treatment generally, and for the preparation of these notes, I am much indebted to Mr. C. H. Fage, the House-Physician to the infirmary.

CASE I.—F. C., female, aged 18, admitted March 17th, 1896. Had been ailing 14 days. She had had diarrhoea and vomiting, and a good deal of bronchitis. There were three spots on the abdomen. She was restless and excitable, and took nourishment badly.

On March 18th she seemed worse; pulse 120. The abdomen was soft. The temperature was reduced by the cold pack, but rose again rapidly. The urine gave Ehrlich's colour reaction. She had 5 c.cm. of antityphoid serum at 4 P.M.

On March 19th there was not much change. The temperature was higher than the previous morning. The tongue was dry. The evening temperature was high, and she was very delirious. No injection was given. The pulse was 144 at night.

On March 20th she was very restless. There were traces of old hæmorrhage in the stools. There was much rhonchus and sibilus in the chest. She had 5 c.cm. serum. The pulse was 124 in the evening.

On March 21st she slept more. The motions were partly formed. The pulse was 124 in the evening, and she looked better; 5 c.cm. serum were injected. The evening temperature was lower.

On March 22nd the pulse was 120. She slept more, and had less delirium: 5 c.cm. serum were injected.

On March 23rd she was much quieter, and had a better night.

On March 24th she looked better; the tongue was cleaner. Ehrlich's reaction was not given by the urine. After this recovery was uninterrupted. Only 5 c.cm. were given as first injection in this case. The dose was probably too small. I also think that probably an unnecessary number of injections were given.

CASE I.

CASE II.—M. L., female, aged 25, was admitted on November 24th, 1896. She had been ill about fourteen days. The tongue was very furred. She was deaf, heavy, and stupid. There were several spots on the abdomen. The spleen was enlarged, and there was some general bronchitis. Ehrlich's reaction was present. Pulse 120, feeble.

CASE II.

On November 25th the condition was much the same. Ten c.cm. were injected at 1.45 P.M. The pulse was 116.

On November 26th the pulse in the morning was 112, in the evening 100. She seemed rather better. Five c.cm. serum were given at 3 P.M. Ehrlich's reaction was not present.

On November 27th the motions were formed; the pulse 120; the breathing quieter. Five c.cm. serum was given at 3 P.M.

On November 28th and 29th she was better.

The convalescence was almost uninterrupted. There were two sudden rises of temperature, which lasted only a few hours.

CASE III.—F. M., a male, aged 19, was admitted on December 16th, 1896. He had had diarrhoea, and had a few spots. The motions were loose and yellow. Ehrlich's reaction was present. The tongue was very furred.

On December 17th he was much the same, and 10 c.cm. serum were given.

On December 18th there was no change in the temperature, but he seemed better. The tongue was clearing in patches. The spleen could be felt. Five c.cm. serum were injected.

On December 19th the tongue was clean, temperature rather higher. Urticarial rash appeared on the right side. Five c.cm. serum were injected.

On December 20th he was about the same. The tongue was rather drier. Six c.cm. serum were injected.

On December 21st there was a good deal of tenderness round the seat of injection, but no deep swelling or glandular enlargement. The rash had extended over the body and itched a good deal, otherwise he was about the same.

On December 22nd the tongue was moist; he slept well, but was suffering from the rash. Ehrlich's reaction was present.

On December 23rd he was better, with the exception of the rash.

On December 26th he was about the same, but on December 29th he was better, and recovery after this date was uninterrupted.

CASE III.

CASE IV.—In this case, which came under treatment about the twelfth day of the disease, and which has not yet quite recovered, though progressing satisfactorily, no improvement was noticed between admission and the first injection. There was much general bronchitis. After each injection the temperature dropped nearly two degrees in the next twelve hours, but subsequently rose again. The patient, however, improved in appearance, the tongue became moister, and the pulse slowed.

REMARKS.

That the serum had a beneficial effect on the progress of the disease I have no doubt; the question remains as to the amount of such effect. In Cases I and II a steady defervescence took place from the date of the first injection, though both cases were, in common with others admitted about the same time, of a severe type, and in the ordinary course of events I should not have expected defervescence to commence for six or seven days. It will be noticed that defervescence took a somewhat long time, so that it is possible that the whole period of this disease was not much shortened, but still the general condition of patients I and II was much less serious during the third week than I have been accustomed to see in cases treated in any other way, not excepting the bath treatment, which I have followed for some years. The state of the tongue improved at once, and the general aspect of the patient changed for the better.

In Case III, and to a slight extent in Case II, some inconvenience was caused by an urticarial rash, which, starting at the seat of the puncture, spread to some distance on the surrounding skin.

No good end would be served by making any extravagant claim as to the value of the serum, and I am aware that these notes must be only of limited value, owing to the comparatively late period of the disease at which the treatment began in each case. I also will not enter into the stormy question of the mode of action of the serum, but simply contribute this paper as a clinical observation.

REMARKS

ON

THE EARLY FEEDING OF TYPHOID PATIENTS

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THE management of the diet in typhoid fever is of the greatest practical importance, and it is well that from time to time the subject should be considered. Certain points have been raised by Dr. Barrs in his recent article upon the early feeding of typhoid patients with solid food, and it is because I think there is a great deal to be said against both his reasons and his conclusions that his article calls for criticism.

The usual practice of the present day is to place a typhoid patient, as soon as the disease is recognised, upon a fluid diet, and not to change it until all trace of fever has been absent for a week or more, and then to make the change to ordinary diet gradually and with great caution.

As to the best kind of fluid diet during the early stage of the fever, and the best method of changing the diet when the time has come, as well as the time at which the diet could be most advantageously changed, there may be considerable differences of opinion. The two first questions need not be raised in the present communication. It is the third question which is raised—namely, as to when the change in diet may be safely made.

The reason that the diet is not changed until the eighth or tenth day after the fever is that there is a general belief that to do so sooner introduces a risk, and many think a considerable risk, of relapse. Dr. Barrs, on the contrary, advocates an early change from liquid to solid food: first, because he does not share this belief; secondly, because he cannot understand the reasons for it; thirdly, because his own experience is against it; lastly, because the patients are underfed and require more food.

In respect of the last objection it may be asserted that no one intentionally starves a fever patient nowadays. On the contrary, as much food of a suitable kind is given as the patient can digest. Nor is milk, if taken in sufficient quantity, a starvation diet. Other patients may live for months upon a milk diet only, and be capable of a considerable amount of active exertion and mental work; and why should typhoid patients starve on it? The wasting and anæmia and debility of a typhoid patient is not the result of his diet, but of the fever, and is similar to that seen in tuberculosis, in which disease the appetite may be even large and yet the wasting continue. What is called a low diet, that is, a fluid diet, is not necessarily a starvation diet. It is often the patient that is low, not the diet, just as asthenic fever describes the patient and not the disease. If a typhoid patient requires more food it can be given him by increasing the quantity of the liquid diet, whatever it is which is being taken, without necessarily making any change in it, and still less putting the patient upon a solid diet.

Nor are the patient's desires necessarily a safe guide in this respect; so far as there is a mere feeling of hunger this can be easily dealt with by increasing the amount of fluid food he is already taking. So far as the desire is for different food, the propriety of yielding to it must be determined by other considerations, for the cravings in disease are sometimes after what is harmful and not after what is good.

After all, then, we come back to the question of fact: Is it,