making of rich blood. This is precisely the risk which the early adoption of a varied and progressive diet seeks to obviate.

At the same time some share in the prevention of relapses has probably been due to the steady continuance of the mercury and iron treatment not only throughout the attack, but for at least a week and a half after defervescence. These views, and further details of treatments, were published in my paper on the Therapeutic Indications in Typhoid Fever in the *Medical Press and Circular* of May 15th, 1895.

In conclusion it is claimed for this modified dietary that it is a distinct improvement on an exclusive milk diet in respect of the nutrition of the blood, of the heart, of the nervous system, and of the bowel; and that it has over the solid alimentation which Dr. Barrs advocates—and of which it supplies the essential constituents—an important advantage in the avoidance of any dangerous stress on the gastric and intestinal digestion, and of any accumulation within the bowel of insoluble and of putrescible residues. Its nutritive success is attested by the aspect and sustained strength of the patients, by their shortened convalescence and greater freedom from sequelæ, and by the absence of that craving which is not only a discomfort but a sign that they are relatively underfed.

REFERENCE.

¹ BRITISH MEDICAL JOURNAL, 1894, i, p. 1126.

REMARKS ON METHOD IN SERUM DIAGNOSIS.

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THERE have now been nearly as many ways devised of applying as there have been observers on serum diagnosis. Some are good, others bad; some macroscopic, others microscopic; some simple, but liable to introduce error; others a little more complicated, but far more accurate. For the present, at any rate, the test will generally have to be carried out in laboratories or in hospitals. It is not well adapted for personal application by the practitioner; hence the more accurate and scientific even if a little more complicated processes are to be preferred.

The macroscopic methods may be dismissed in a few words, since they either require a comparatively large quantity of blood if for use in a test tube (Widal¹) or are not completely reliable if applied in a capillary tube (Wright²), and in any case an interval of nearly twenty-four hours must elapse before the diagnosis can be made.

In the microscopic methods two points are of importance: (1) sufficient dilution, which should be effected without bringing undiluted serum into contact with the bacilli, (2) a time limit. As regards the first point, one observer (McWeeney³) made his tests apparently without any dilution, and others (Widal,⁴ one of the earliest workers in this field, Delépine and Sidebotham,⁵ Wyatt Johnston and McTaggart⁶) dilute from equal proportions to about 1 in 10, with such accuracy as their various procedures permit. That this dilution is insufficient was pointed out in my first communication on the subject,⁷ and Stern,⁸ Du Mesnil de Rochemont,⁹ Bates Block,¹⁰ and others have confirmed my statement. Of course the number of normal serums which react well in a dilution of 1 to 10 is small; but it introduces a source of error, although, some may think, on the right side.

I have not yet come across a case in which the serum would not react at some time in the course of the disease in the dilution of 1 to 32—namely, diluting the serum to 1 to 16, and then mixing a drop of diluted serum with a drop of the culture; and even the most enthusiastic observer, Widal, in his earliest communications, remarks that if the reaction does not succeed on one day, it must be tried again during the following days, and that a negative result does not therefore exclude the diagnosis of enteric fever. On the other hand, I have not yet met with a serum other than that of a typhoid patient which would react in this dilution. A few observers have come across such cases, without, however, positively excluding a previous attack of enteric fever. It is

of course obvious that a day longer may elapse before the serum will react 1 in 32 than for 1 in 10, but in the latter case it may be only a normal reaction. The question therefore put shortly is, Is it better to make a positive diagnosis of enteric fever, which in a small percentage of cases may be wrong, or to postpone the diagnosis for a few days, with the nearly absolute certainty of having it right? It appears to me that the latter alternative is preferable from the standpoint of both practical and scientific medicine.

The question of time limit has, curiously enough, not received much attention. It is, nevertheless, of some importance; for in the course of twenty-four hours a good number of serums will show the reaction, especially in a warm room.

It is desirable to use an attenuated culture of the typhoid bacilli, since it seems to be less often affected by normal sera. Also an emulsion from an agar culture presents some advantages over a bouillon culture, especially for comparative and quantitative experiments.

Capillary tubes of not too fine a bore rather than capillary pipettes are advisable for collecting the blood since they can be centrifuged if desired (and this is always to be recommended), or, after a short time, the string of clot and serum can be blown out on to a glass slide, and the serum, containing however some corpuscles be taken up in graduated capillary pipette and suitably diluted. Capillary tubes are perhaps rather more easily broken than capillary pipettes, but this disadvantage care in use can easily obviate.

The method here recommended is, I claim, at any rate not inferior to any other proposed: it is almost as simple, and considerably more accurate, and this opinion is endorsed by its having been adopted for purposes of serum diagnosis in the Johns Hopkins Hospital at Baltimore.¹⁰

Finally it may be as well again to emphasise the fact that, owing to the inherent agglutinative power of the serum of many normal individuals, it is more easy to obtain a positive than a negative result unless suitable precautions are taken, so that it cannot be assumed, as Professor Delépine¹¹ would have us do, that negative results or quantitative estimations imply inferiority of method.

REFERENCES.

¹ Widal, *La Presse Médicale*, 1896, p. cclviii. ² Wright, *BRITISH MEDICAL JOURNAL*, i, 1897, p. 139. ³ McWeeney, *ibid.*, p. 147. ⁴ Delépine and Sidebotham, *Lancet*, ii, 1896. ⁵ Johnston and McTaggart, *BRITISH MEDICAL JOURNAL*, ii, 1896, p. 1629. ⁶ Grünbaum, *Lancet*, ii, 1896, p. 326. ⁷ Stern, *Centrab. f. inn. Medicin*, 1896, No. 49. ⁸ Du Mesnil de Rochemont, *Münchener med. Wochenschr.*, 1897, No. 5. ⁹ B. Block, *Johns Hopkins Hospital Bulletin*, 1896, Nos. 68-69. ¹⁰ *Ibid.* ¹¹ *BRITISH MEDICAL JOURNAL*, i, 1897, p. 529.

A CASE OF RUPTURE OF SPLEEN; SPLENECTOMY; DEATH.

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A. B., aged 51, a labourer, was brought to the Hampstead Hospital at 10.30 on the morning of March 8th. About half an hour before admission, whilst driving a cart, he was caught between the shaft of his own and the wheel of a passing wagon. He stood up and was taken to a neighbouring inn, where brandy was administered, and he was then driven to the hospital.

On admission, he complained of pain in the abdomen, especially on the left side, and looked extremely ill. His face was pale, his lips blue, respirations rapid, and pulse very collapsing. There was no evidence of fractured ribs. The abdomen was almost motionless, and the left side was exceedingly tender, there being distinct dullness in the flank, which did not alter with change of position. The right flank was resonant except towards the extreme back. He passed urine which did not contain blood, and the bowels acted twice naturally.

He seemed to be in great pain, and to alleviate this tincture of opium πx was given. A diagnosis of internal hæmorrhage with probable rupture of spleen was made.

At 11.30 the condition of the patient was decidedly worse.