SUMMARY.

1. Streptococci were found in the vagina before and after delivery in 63 per cent. of the cases examined. They may therefore be regarded as among the normal flora of the part.

2. Haemolytic streptococci were only found twice in the examination of 108 vaginal swabs. *Strep. pyogenes* was never found.

3. The predominant non-haemolytic streptococci of the vagina were *Strep. faecalis* and *Strep. mitis*.

4. Non-haemolytic streptococci were present in the post-partum uterus in at least 20 per cent. of the cases examined.

We hesitate to draw any conclusions from our findings, but we suggest the following without wishing to dogmatize.

1. The commonest form of puerperal sepsis, that caused by haemolytic streptococci (and particularly *Strep. pyogenes*), is due to exogenous infection.

2. Non-haemolytic streptococci do occasionally cause puerperal sepsis. These organisms are present in the vagina of the majority of parturient women and are found fairly frequently in the uterus post partum. They are normal body saprophytes, but are opportunists as regards pathogenicity. (The *Strep. faecalis* may give rise to suppuration in wounds, and the *Strep. mitis* to septicaemia and subacute endocarditis.) Puerperal sepsis due to non-haemolytic streptococci is an endogenous infection. The cause is the streptococci of the vagina plus some unknown factor, which may be a local or general lowering of the patient's resistance or a rapidly enhanced virulence of the organism.

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BLOOD COAGULATION TIME IN THE INSANE.

BY

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WHEN discussing with my friend Dr. F. E. Taylor the occurrence of haematoma auris in insane persons, he mentioned that it had been found that in cases of spontaneous haemorrhage into the vitreous the coagulation of the patient's blood had been delayed, and suggested that haematoma auris might be due to the same cause. It was Dr. Taylor's suggestion that induced me to make the investigation here recorded.

I found that the blood coagulation time was markedly prolonged in cases of haematoma auris, and I then deemed it advisable to test the blood of cases of insanity in general. The only reference I can discover in the literature to the blood coagulation time of insane persons is a paper by E. J. Larsen and H. Lind, who in 1920 recorded a series of 50 insane patients. They found that in all these patients the time was within normal range. I have not been able to see the original paper and do not know what method they used.

I have not succeeded in finding any reference to the matter in any of the textbooks or other works to which I have been able to refer. The subject of blood coagulation time, but without reference to insane subjects, has occupied the attention of many observers.

The method of measuring blood coagulation time adopted by different observers not only varies extremely, but there is no uniformity in the end-reaction which is sought. Thus, E. H. Lepper,¹ adopting the method of Dale and Laidlaw, takes the onset of coagulation as the point to be determined. This method is obviously objectionable as coagulation would be hastened by the agitation employed.

J. Addis² views under the microscope the edge of a drop of blood suspended in oil and acted on by a current of oil streaming against the edge of the drop. When a continuous smooth flow of the corpuscles ceases he concludes that coagulation has occurred in the drop. The apparatus used is not simple, and is open to the objection that contact with oil hinders or prevents coagulation.

The method of Sir Almroth Wright³ is the simplest and most easily applicable. I adopted his method in a modified form in my experiments. I used capillary glass tubes 1 mm. in diameter and 6 cm. long; 2 cm. of the tube were filled with finger blood, the blood aspirated into the middle of the tube, and one end sealed in the flame. The unsealed ends

are then fixed in plasticine, and nipple, glass tubing, and plasticine are floated in a beaker of water kept at 37° C. A Hagedorn straight needle was used for pricking the finger, momentarily congested by a tape, and it is easy to fill simultaneously the four tubes used for each experiment by holding the tubes fan-shape between finger and thumb and inserting the approximated ends in the drop of blood.

I examined 117 cases, all being free from organic disease. In addition I examined 12 cases of normal sane persons. The average coagulation time in the 117 cases was 4.69 minutes. The average time in 12 normal sane persons was 3.75 minutes. This corresponds closely with the time given by other observers. J. H. Drysdale⁴ says that normal coagulation time at temperature of body is about three or four minutes. E. R. Stitt⁵ says that by Sabrazès's method finger blood coagulates in three to four minutes at room temperature.

Of the whole 117 cases, 63 gave coagulation times over the normal in sane patients. Of 10 cases of haematoma auris, 7 gave coagulation times above the normal. While these were the general results, it was noted that in 16 cases the time was six minutes, and 11 of these cases were mania. On the other hand, 14 cases gave a time under four minutes, and 10 of these were cases of dementia.

For some reason or another cases of haematoma auris are now very rare among the insane. In the private asylum where I am employed there are only 2 cases (recent), and at the East Sussex County Mental Hospital at Hellingly, with 1,350 patients, there were only 8 cases, and these were all old ones.

Tabulating the results we find—giving coagulation time over the normal: haematoma auris cases, 70 per cent.; insane cases, excluding haematoma, 52.3 per cent.; sane cases, 16.6 per cent. Coagulation time tends to decrease with increase of age of the patient.

Conclusions.

1. The proportion of insane patients showing an abnormal condition of the blood is sufficiently large to indicate a line of treatment.

2. The prolonged coagulation time may well account for malnutrition of the brain tissue, and for the cerebral haemorrhages which so often occur in the insane.

3. The method of determining the coagulation time, as I have described it, is so simple that it can be easily done at the bedside.

4. Further investigation is needed to ascertain the factor or factors which prolong the coagulation time.

Is delayed coagulation in insanes due to decalcification, or to deficiency of prothrombin, or to deficiency of thrombokinase, which activates prothrombin, or which, according to Howell, is of lipid nature and neutralizes antithrombin?

It is probably not due to toxic substances produced by infective agents, as these would liberate a certain amount of nucleo-protein in the blood, and so produce coagulation.⁷

Halliburton² says that if we reject the thrombin theory with all its superstructures we accept a physical and not a chemical change as the cause of coagulation.

Sir A. E. Wright⁸ points out that diminished coagulability of the blood is of very great practical importance, because it interferes with haemostasis, and also because it conduces to serous haemorrhage (in other words, to increased transudation).

It is to be noted that the observed blood coagulation time varies according to conditions of observation, temperature, etc., and the relative time between sane and insane is the important point. All my observations were made under exactly the same conditions. The absolute time will vary according to the method of observation.

My thanks are due to Dr. Taylor for the suggestion and much kindly advice, and to Dr. J. N. Greene Nolan of the East Sussex County Mental Hospital, Hellingly, where most of the work was done by kind permission of the medical superintendent. The rest of the work was done at Ticehurst House, Sussex, and I have to thank Dr. Colin McDowall for the facilities he gave me.

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