but no one could say that he had been seen again in the district. The cook's statement that the bloodstains on his clothing were from a pigeon's blood which he had killed for his master's dinner was confirmed by the analyst's report. Fortunately, among the papers found in the dispatch box was a calendar in book form printed in the Bengali characters, with an outside cover of a light blue paper, which is usually found on native-printed books. On this cover were noticed two thin brown smudges, which, under a magnifying-glass, were recognized as impressions of one of the digits of some person's right hand. In the Central Office of the Bengali police the finger impressions of all persons convicted of certain offences are classified and registered, and the impression on the calendar, when compared, was found to correspond exactly to the right thumb impression of Kangali Charan, the ex-servant above referred to. In consequence he was arrested some hundreds of miles away and brought to Calcutta, where his right thumb impression was again taken and corroborative evidence collected. The chemical examiner to the Government certified that the brown marks on the cover of the calendar were mammalian blood, the inference being that the actual murderer or some associate had knocked his blood-stained thumb against the calendar when rummaging amongst the papers in the dispatch box for the key of the safe; and the accused person was committed to stand his trial charged with murder and theft, and finally convicted, but in the absence of direct evidence to the deed being committed, capital sentence was not carried out. Since then, however, a special law has been passed by the Indian Council admitting the evidence of experts on finger-print identification in courts of justice.

SERUMTHERAPY BY THE MOUTH.*

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FOR eight years I have been using by the mouth serums, both normal and the product of immunity, with remarkable results. Their action thus used is neither antitoxic nor antibacterial. The theory which best explains their action is that of tissue resistance. That is, that along with antitoxic and antibacterial resistance to infection, or alone when those other elements are absent, there is produced an increased resistance in the tissues to the pathogenic action upon them of the organisms present; that this produces what may be called a sterile soil without harmfully affecting the organisms themselves. This is present in active immunity, and can be transferred to the patient as passive immunity by the oral use of the serum in regular doses.

This tissue tone constitutes initial resistance to infection, and varies in man and animals; in the latter both as species and individuals. It may be defined as the capacity of the tissues to carry on their functions unimpaired in the presence of infection. This is health. Disease occurs when the tissues are impaired in their functions, and recovery when their resistance has been so restored that they are once more capable of carrying on their normal functions even though the organisms are still present. The presence and vitality of the organisms in typhoid and pneumonia when the patients are afebrile and convalescent can be rationally explained on such grounds. The tissue resistance has been raised to such a degree that the organisms are incapable of further affecting them. The organisms themselves having no suitable soil for their action are readily eliminated.

The oral use of normal plasma† of the horse, sheep, and ox in doses of one drachm four times a day in non-microbial cases of function deficient through lack of nutrition produces a restoration of function by removing the lowered nutrition. A favourable class of case for this is lactation deficient in quantity or quality, or both, in a debilitated patient. The restoration of the patient's nutrition by the renewal of her appetite, digestion and assimilation

of food leads to a perfectly normal lactation which may be maintained by a continued use of the plasma as required.

The same result is obtained by injections where function is deficient through lack of nutrition due to microbic action on the various tissues involved.

The reaction leading to restored function is obtained in the presence of those infections to which the animal itself is refractory, but in no other infection. Thus the serum of the horse and sheep, of the greatest service in tubercle, are valueless in influenza, the animals themselves being as susceptible to that infection as man. Ox plasma is of the greatest service in influenza, as the animal is extremely resistant to that infection. Thus, only in those infections to which the animal is itself refractory is the reaction obtained. Hence it is concluded that by this method of use the natural resistance of the animal to infection is being transferred to the patient.

The results cannot be due to the albumin in the serum, as no albumin could have any such effect, even if absorbed. In my opinion the results are due to the action of certain elements in the serum elaborated for the energizing of the tissue nerve centres, and these elements being probably of glandular origin, are readily absorbed and produce in the patient the reactions for which they were intended in the animal. Thyroid and suprarenal gland by the mouth have the same easy absorption, and produce their characteristic physiological effects in the patient exactly in the same way.

These are the elements in the serum which will be developed to meet the action of the organisms on the tissues, and on their presence and power will its defence depend.

Antidiphtherial Serum.—In diphtheria there is present a paralytic agent acting mainly on the involuntary muscular system, and to resist that muscle depressant there is developed a muscle recuperative element in the serum available by its oral use. There is also a proteolytic agent causing the production of digestive action and leading to the formation of albumoses and other products of digestion, and to meet this there is produced in the serum an antiproteolytic power also available by oral use of the serum. In diphtheria the concurrent use of the serum by the mouth in doses of 1 drachm with the hypodermic injection materially assists the recuperative powers of the patient, and leads to a rapid and complete recovery when given in time.‡

The recuperative action on the involuntary muscle is obtained in shock from traumata, haemorrhage, etc., where the cause is non-microbial. It is also obtained in the presence of the staphylococcus, streptococcus, and *Bacillus coli communis*. By its action on the voluntary muscle the vasomotor tone is restored to normal, and inflammation is thus very directly treated, and on Nature's own lines.

The proteolytic action of the staphylococcus and the *Bacillus coli communis* is directly combated by the antiproteolytic element in the serum and by the conjoint action of this and the recuperative power of the serum the pathogenic action of these organisms on the tissues is specifically antagonized. That these elements have no antitoxic or antibacterial or other harmful effect on the organisms present is shown by a prompt relapse should the treatment be discontinued before the patient has thoroughly recovered. Where required there is also produced a marked leucocytosis, which is probably more clearly apparent from the restored vasomotor tone causing the reduction of surrounding inflammation, and thus concentrating the phagocytes on the focus of the disease. In the stage of inflammation before death of tissue and pus formation, the proper use of antidiphtherial serum should promptly arrest the process. In the stage of loculation its use should maintain the general tissue tone, prevent metastasis, and more rapidly mature the loculation. After evacuation it should rapidly clear up the cavity, promptly reduce the pus formation, and promote the rapid convalescence of the patient.

All of these it has done in an experience of eight years.§

* Read before the Chelsea Division of the Metropolitan Counties Branch of the British Medical Association.

† Messrs. Allen and Hanburys supply the normal plasma in their Bynin series as byno-plasma, a palatable preparation, without suggestion of blood, and which preserves the plasma sweet while in use. The dose is half an ounce.

‡ Messrs. Parke, Davis, and Co. have been preparing for me for years a low-potency antidiphtheric serum specially made for oral use. The dose is one drachm, generally four times a day, but in acute cases twice as frequently.

§ Messrs. Baillière, Tindall and Cox have nearly ready for publishing a work on this subject, giving 275 cases of its use in the various conditions in which it has been found serviceable, as well as a fuller explanation of the principles suggested as explanations of the facts.