INFECTION DISEASES.

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THE CURATIVE INFLUENCE OF EXTRACTS OF LEUCOCYTES UPON INFECTIONS.

Hiss and Zinsser (Journal of Medical Research, November 1908) have investigated the effects of injection of leucocytes into infected animals. Hiss considers that in many diseases we are dealing with an immunity which is largely cellular, not only as regards phagocytosis and digestion, but also as regards the neutralisation of the toxins set free by disintegrated bacteria, the cells not only ingesting the germs, but, unaided by bodies in the plasma, neutralising their products. His object in administering extracts of leucocytes has been to assist in this process, by protecting the white cells of an infected animal from destruction, and to give them an opportunity to recuperate. The scope of his investigation included the determination of the effect of extracts of leucocytes of both normal and immune animals on infections, the effect of immune serum alone and combined with leucocyte extracts, and the effect of extracts of blood-forming organs such as the spleen and the bone marrow. The extracts used were, for the most part, prepared from rabbits, by means of double pleural inoculations with aleuronat, such inoculations producing from 30 to 60 c.c. of turbid fluid in 24 hours. After centrifugalisation, the cells were washed in normal saline solution, and the extract was then obtained by emulsifying them in distilled water, and maintaining them at 37.5° C. for a few hours. A large number of rabbits were inoculated intravenously with typhoid, pneumococcus, streptococcus, and meningococcus cultures, and an injection of 5 c.c. of the extract was administered at varying intervals from the moment of infection. It was found that, whereas the control animals nearly always died, those which were treated made for the most part good recoveries, or, at least, survived considerably longer than the controls. Hiss concludes that extracts of leucocytes from normal rabbits have a distinct modifying and curative action, when given subcutaneously to infected rabbits, even should the infection be one which is usually rapidly fatal to the species. Rabbit leucocyte extracts are also active in guinea-pigs, saving them from fatal infections. If the extract is prepared from an immunised rabbit it is probably even more effective than that from a normal animal. These good results Hiss attributes chiefly to poison-neutralising or destroying bodies, which act on the endotoxins of the germs concerned and thus relieve the leucocytes of the animal from fatal poisoning. He suggests the name endo-antitoxins for these substances, considering them antibodies which are not normally given up to the plasma by the cells possessing
them, and which, in this peculiarity, resemble the bodies against which they appear to be most efficacious—the endotoxins—which are fixed constituents of bacterial cells.

Applying the experience, thus gained from animals, to man, Hiss, in conjunction with Zinsser, has treated 24 cases of epidemic meningitis, 7 of lobar pneumonia, and several of other infections. We need only concern ourselves here with the meningitis cases. Doses of 10 c.c. of the extract were usually employed and were injected subcutaneously. The total amounts given varied much in different instances, some patients receiving as much as 230 c.c. in all. Of 22 cases watched to a termination, 14 were discharged cured and without sequelæ. The remaining 8 died. The mortality, then, was a little over 36 per cent. This is a surprisingly low figure, always assuming that the mortality of the epidemic was in any way comparable to that recently observed in Edinburgh. The cases, from their description at least, appear to have been averagely severe, and the diagnosis was confirmed by bacteriological examination. A curious point is, that of 7 cases, in which treatment was begun subsequent to the seventh day of the disease, all recovered without sequelæ. On the other hand, of 15 patients, who received their first injection within a week of their first symptom, 8 or more than half died. There is no suggestion here that early injection is of paramount importance, as is the case with serum treatment, and this to some extent weakens the claim that the extract is very efficacious. On the other hand, cases admitted early to hospital are often very severely ill, and not infrequently hopeless, and some allowance must be made for that possibility. Still, it is remarkable that such uniform success should be obtained in a group of cases all of which were more than 17 days ill, and of which 5 had been ill for over 39 days. It would almost seem that, if the leucocytes really contain an anti-endotoxin, it neutralises a poison which is particularly concerned in causing the chronic phenomena associated with the disease and has only a moderate effect on the toxins responsible for the acute symptoms. The absence of chronic sequelæ in all the cases, whether treated early or late, points in the same direction, and, knowing as we do that in the case of diphtheria more than one toxic substance plays a part in the production of symptoms, it is quite conceivable that the same is the fact in meningitis. Hiss reports that even in fatal cases marked improvement was often observed in the toxic symptoms, such as delirium, vomiting and stupor, and that the temperature was frequently favourably influenced. The erratic course of the disease, however, renders definite conclusions on these points extremely difficult, as those of us who have worked with various serums know only too well. In any case, the writers are to be congratulated on a very admirable and interesting piece of work, which is highly suggestive in many ways, and which certainly should encourage other
observers to make a trial of the line of treatment described. Evidence, moreover, corroborating their experimental work will be awaited with much interest.

**The Administration and Dosage of Anti-Meningococcic Serum.**

Dunn (Boston Medical and Surgical Journal, 3rd December 1908) lays down rules for the administration of Flexner’s serum in cases of cerebro-spinal meningitis. He has treated 57 patients with this preparation, and he has come to the conclusion that to obtain the best results it is necessary to give large and frequent doses. The subcutaneous method of injection is useless, and subdural administration should be always employed. He believes that the danger to be apprehended from increased dural pressure, in those cases in which no cerebro-spinal fluid has been obtained on puncture, is small in comparison to that of not giving the serum into the spinal canal, and my own experience at the Edinburgh City Hospital quite bears out this contention. Small doses of 15 or 20 c.c. did not give results as satisfactory as those when a larger amount was injected, and Dunn recommends 30 c.c. as a minimum, even if much less fluid has been obtained on lumbar puncture. The only exception allowed is in the case of very young babies, if any difficulty is experienced in introducing so large an amount of serum. He lays stress on the importance of draining away all the cerebro-spinal fluid which will flow, believing that the negative pressure so caused assists in the diffusion of the serum injected. In adults, a dose of 45 c.c. should be given if possible, especially if the symptoms are severe. The injections should, in ordinary cases, be repeated daily for 4 days, and should be continued even longer if the symptoms have not entirely subsided or if diplococci can still be detected in smear preparations. In very severe cases Dunn recommends repeating the dose in 12 hours, and has found that the results are excellent. I have had a similar experience with patients apparently moribund, and am convinced of the value of frequent doses. Dunn holds that by giving daily injections for the first 4 days, irrespective of the severity of the symptoms, there is much less chance of subsequent relapses, and it seems reasonable to adopt such a course, even should the worst manifestations disappear, as they not infrequently do, in 2 or 3 days. In chronic cases the fluid must be examined at intervals, and should diplococci be detected the serum must be again employed. Relapse should be treated exactly on the lines of the original attack. Dunn’s paper is illustrated by several most instructive temperature charts.

It is interesting to find that very similar views as to the administration of anti-meningococcic serum are expressed in France. Netter (Semaine Médicale, 10th March 1909) insists on the advantage of intra-
spinal injections, and recommends doses of 20 to 30 c.c. for children, and from 30 to 45 c.c. for adults. These should be renewed several days in succession, whatever the result of the injection. Netter does not state which serum he employs, but it will be noticed that his method of administering it is identical with that of Dunn. Vaillard at the same meeting of the French Academy of Medicine reported that, whereas the first 5 patients in a barrack outbreak at Evreux, who were not treated with serum, all died, of the remaining 18 patients, all of whom received intra-spinal injections, no less than 16 recovered. Evidence, then, is accumulating on every hand that, with a reliable anti-meningococcic serum properly administered, much may be done to keep within moderate limits the appalling mortality of cerebro-spinal meningitis.

DISEASES OF THE EAR, NOSE AND LARYNX.

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THE USE OF THE X-RAYS IN THE DIAGNOSIS AND TREATMENT OF CERTAIN AFFECTIONS OF THE NOSE AND THROAT.

When the Röntgen rays were first suggested as a further means of facilitating diagnosis many were sceptical as to the possibility of their diagnostic value in connection with affections of the nasal cavities and their accessory sinuses. It was thought that the thickness of the cranial bones would so interfere with the passage of the rays through the skull that the detection of pathological changes in the bones themselves or in the cavities enclosed by them would hardly be possible. While it is equally true to-day that the structure of the cranial bones increases the difficulty in obtaining as clear a picture as in the case of the limbs or even of the chest, the improvements in technique and in the construction of the apparatus employed have largely overcome this difficulty. The X-rays have undoubtedly established their position as additional means of assistance, not only in the diagnosis of certain conditions of the nose and throat, but also by supplying the surgeon beforehand with an anatomical conception of the field of operation. The value of this latter point is evident when we remember the great variations in the size and outlines of the different accessory nasal sinuses. In a short review of this kind it is impossible to go into detail; our object is rather to refer to some of the more salient points in their application to the head.

In connection with the nasal and accessory cavities the method of