REPORT CX.

ON THE DIFFERENCE IN CONTENT OF IMMUNE SUBSTANCES IN BLOOD SERUM AND PLASMA.*

BY

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[*Abstract.*]

SERUM and plasma obtained from rabbit's blood have been compared as regards their agglutinating action on the *Bacterium coli* before, during, and after immunization with that organism.

It is found as a general proposition that the *plasma* of an animal is more strongly agglutinative than its *serum*, owing, as we believe, to the loss of some of the agglutinin of the latter in consequence of an "absorption" of agglutinin by the constituents of the clot formed in the blood from which the serum is derived.

This general proposition being fully established by the observations made, it follows that if the serum is at any period found to be as strong as the plasma, and still more if it is found to be the stronger of the two, its increase in agglutinating power must be due to some factor partially or completely absent from the plasma, which *adds* enough agglutinin to balance, or more than balance, as the case may be, the loss by "absorption."

In the observations now recorded the serum has been found always to be stronger than the plasma during the period of *latency and rise* in the immunity curve of agglutinin production. And the percentage difference between the two is shown to be greatest during the earlier portion of this period, that is, at a time which corresponds to the time of maximum leucocytosis following the inoculation.

It is, therefore, suggested that the factor in question causing increase in the agglutinins of the serum is the leucocytes of the blood, which are allowed to break up in the sample used for the preparation of serum, but are rapidly separated from the plasma in an extremely powerful centrifuge.

When there is no longer leucocytosis in the blood, and the activity of agglutinin production in the body begins to wane, the amount of agglutinin derived from the leucocytes present no longer overpowers or even equals the loss by "absorption"; and from this point onwards the plasma always shows the higher values.

These observed facts explain the disagreement in the results obtained by previous workers, who paid no regard to the particular stage of immunity with which they were dealing when they made their comparisons between the serum and plasma.

The view here put forward is strengthened by the observation, several times repeated, that if in an immunized animal a new increase in agglutinin production be induced by the inoculation of a totally different micro-organism, this *non-specific* stimulation rapidly results in the serum again becoming stronger than the plasma in specific agglutinating power. We are unable to offer any explanation of this result unless it be dependent on the increase in the activity and number of the leucocytes present in the blood.

But if this explanation be the correct one, it affords strong evidence that the leucocytes and leucocytic tissues (bone marrow, endothelia, etc.), some, or all of them, are concerned in the development of immunity, and are the source, or, at any rate, *a* source, of origin of the specific antibodies—agglutinins.

Incidental evidence has also been obtained which shows that plasma, as contrasted with serum, is relatively destitute of *complement*. And this affords additional support to the view that the complement of blood is derived from its leucocytes.

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REPORT CXI.

OBSERVATIONS ON THE PRODUCTION OF IMMUNE SUBSTANCES.*

BY

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[*Abstract.*]

IF an animal (rabbit) which has been immunized against the *Bacterium coli*, and whose immunity has passed its maximum by a longer or shorter interval of time, receive an inoculation of a different organism, a new rise occurs in the curve of specific *coli* agglutinins in its blood serum. But if the interval which has elapsed before this inoculation is made be of such a length that the immunity of the animal has ceased to be measurably greater than it was before immunization was originally begun, no perceptible increase in agglutinins occurs.

That is to say, that the cells and tissues which are thrown into activity by the new inoculation are precisely those which were already occupied in the formation of agglutinin, and whose stimulation, therefore, leads to its increased production.

Now the tissues which are known always to be stimulated by bacterial inoculations are the leucocytic tissues of the body (bone marrow, lymphatic glands, endothelia, etc.). The observations recorded, therefore, tend to show that these tissues are the site, or *a* site, of production for the specific antibodies—agglutinins.

The question whether possibly other tissues also are concerned in the production is not here considered. At present we are not aware of any clear and satisfactory evidence in its favour.

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Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

INDUSTRIAL SYPHILIS.

THE notes of a case of syphilis published by Mr. Snell in the JOURNAL of December 5th, 1908, are of paramount importance, and afford another piece of evidence for the compulsory notification of syphilis as an infectious disease. It reminded me of a similar case I had early in that year.

A young woman, aged 22, engaged as a coatmaker, consulted me for a sore she had had on her lip for some week or ten days; it was increasing in size. On the first visit I did not suspect anything of a specific nature, thinking it was simply an infected herpetic vesicle; and also I knew her and her family to be most virtuous. But at her next visit the appearance of the sore raised my suspicions, and upon examination I came to the conclusion that it could be nothing else but a primary chancre. This was afterwards confirmed by a consultant, and the train of symptoms which followed, but they were of a mild character. When I made up my mind as to the correct diagnosis, I endeavoured to find out how she became infected. I put the question as guardedly as possible, but could not elicit anything definite. I told her I should like to see her mother, when, as delicately as possible, I put the case before her, asking particulars about her companions and her work. Her companions at home were above suspicion, but at her place of business it was different; she was engaged in her occupation in a workroom where there were several women engaged, and each one had a different part of the coat to make, and in its various stages was passed from one to another; the girl herself suggested that the sore might have been produced by dye in the cloth with which she was working. To get the hem of the cloth into a workable condition she was in the habit of pressing it against her chin and passing it across several times, so as to make it flat and even. I then inquired as to the health of her fellow workpeople, and the majority