

phenomena observed in the human and in the animal, the following can be asseverated.

After salvarsan injections in animals there ensues a peripheral leucopenia of short duration, during which period the leucocytes are mechanically retained in the blood of the liver. A short leucopenia after salvarsan injection is also observed in the human. It is highly probable that the leucopenia in the human observed after injection of salvarsan is also due to a similar retention of the leucocytes in the blood of the liver.

51 (2574)

On the antigens of red blood corpuscles.

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Experiments reported in a previous paper¹ led to the view that specificity as manifested by precipitin reactions on serum proteins and agglutinin or lysin reactions on red cells is based on structures of two different sorts. While the differences are apparent in the case of heterogenetic lysins and isoagglutinins, the findings in agglutinins and lysins in general seem to indicate the existence in the antigens of substances other than proteins (but probably bound to them).

As a matter of fact, the antigenic properties of blood cells have been ascribed to "lipoid" substances by several authors since the work of Bang and Forssman.² It was difficult to accept this notion in view of the fact that extracts of erythrocytes made with organic solvents and supposed to contain the antigen have a feeble action as compared with the original material, and that the residues after such extractions are still active (Thiele and Embleton).

¹ *J. Exp. Med.*, 1924, xl, 91.

² *Beitr. z. chem. Phys. u. Path.*, 1906, viii, 238. The bibliography will be given in the more detailed article on this subject. Cf. Schmidt, H., *Zur Biologie der Lipide*, Leipzig, Kabitzch, 1922.

We have studied the antigenic properties of the alcoholic extracts of horse blood cells, using the method employed by one of us for the heterogenetic haptene.³ By injecting mixtures of alcoholic extracts of horse red cells and diluted pig serum, we succeeded in obtaining hemolytic immune sera for horse blood stronger than those obtained with extracts alone. These sera, prepared by injections of extracts plus serum, or alone, differ markedly from those produced in the usual way by injecting unchanged erythrocytes. They exhibit a relatively higher ratio of lysin:agglutinin.⁴ They are distinctly inhibited by alcoholic extracts of horse blood, in this respect simulating heterogenetic antibodies. Their hemolysins were completely absorbed by donkey blood, contrary to the behavior of the common hemolysins.

After several extractions with boiling alcohol of horse blood stromata, previously treated with 5 percent salt solution and weak acid, the remaining substance still had antigenic properties. The resulting agglutinins were weaker than but similar to those with unchanged blood cells. This residue consisted of an insoluble substance remarkably resistant to acids and alkalies. It gave protein reactions, but also a positive test with orcin and copper sulphate.⁵ The nitrogen content of this product (about 13 percent) increased gradually when further extractions with alcohol were made. The orcin test was still positive.

These studies are being continued.

³ *Biochem. Ztschr.*, 1921, cxix, 306. *Proc. Acad. Sc. Amsterdam*, 1922, xxiv, 237. Landsteiner, K., and Simms, S., *J. Exp. Med.*, 1923, xxxviii, 127.

⁴ Landsteiner, K., and Prasek, *Zeit. f. Immun.*, 1912, xiii, 403.

⁵ Levene's Reaction.