to be either bactericidal or bacteriostatic, which is responsible for any therapeutic effect which may occur in the blood and tissues after the injection of mercurochrome. (Conditions after excretion through the kidney are different, for the mercurochrome is then freed from the protein.)

Since the injection of neoarsphenamine is not so commonly followed by febrile reactions as is that of mercurochrome, it might be expected that the changes which it would produce in the plasma colloids would also be less marked. This is exactly what we have observed with the specimens of neoarsphenamine thus far tested.

After the intravenous injection of 20 mgm. neoarsphenamine per kilo into the rabbit, the plasma particles seem to become definitely more brilliant, but the change is much less marked than that observed after mercurochrome.

We are, therefore, investigating the relation of colloidoclastic reactions observed after the intravenous injection of drugs and in pathological conditions, upon the ultramicroscopic appearance of plasma proteins.

4849

Effects of the Commonly Used Anticoagulants on the Ultramicroscopic Appearance of Frog's Plasma.

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(Introduced by Arthur D. Hirschfelder.)

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A series of investigations are in progress in this laboratory dealing with the changes brought about in the blood plasma by the injection of drugs and also by various pathological conditions.

Since some method of preventing the coagulation of the blood plasma has to be employed, it became essential to study the effects of the commonly used anticoagulants on the appearance of plasma under the ultramicroscope. In previous communications[1, 2] oxalated rabbit's plasma had been used.

Samples of frog's blood *(Rana catasbiana)* were collected into oiled tubes without the use of any anticoagulant, centrifuged, the

[1] Wright, H. N., and Hirschfelder, A. D., PROC. SOC. EXP. BIOL. AND MED., 1929, xxvi, 790.

[2] Hirschfelder, A. D., and Wright, H. N., PROC. SOC. EXP. BIOL. AND MED., 1930, xxvii, 547, 548.

plasma pipetted off and diluted 1:5 with specially prepared, particle free, 0.75% physiological saline solution, and examined under the ultramicroscope. Similar samples were received into heparin (1/3 mgm. per cc.), potassium oxalate (2 mgm. per cc.) and sodium citrate (2.5 mgm. per cc.). The blood was also made non-coagulable by injection of heparin into the dorsal lymph sac 45 minutes previous to bleeding. The appearance of the various samples of plasma was then compared under the ultramicroscope with the normal plasma obtained without the use of any anticoagulant. Quantitative readings were also made of the relative refractiveness of the various plasmas, employing the photometer described by Hirschfelder and Wright.[3]

The use of heparin either *in vivo* or *in vitro* produced only small changes in the appearance of the plasma. With potassium oxalate the particles appeared smaller, greater in number, and of increased refractiveness. Sodium citrate brought about a very marked reduction in the apparent size of the particles, with corresponding increase in the number of particles visible, and increase in refractiveness. This change in the colloidal equilibrium of the plasma proteins with addition of sodium citrate may be of importance in connection with the use of sodium citrate as an anticoagulant in blood transfusions.

Similar experiments on mammalian and human plasma are in progress and will be reported at a later date.

4850

Effect of Novasurol Upon the Ultramicroscopic Appearance of Frog's Plasma.

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In a previous paper it has been shown by Bieter[1] that dilute solutions of mercuric chloride injected via the ureter in frog's kidneys, inhibit the reabsorption of water and phenolsulphonephthalein. Unpublished observations in this laboratory indicate that this action might also be shared by novasurol.

[3] Hirschfelder, A. D., and Wright, H. N., PROC. SOC. EXP. BIOL. AND MED., 1930, xxvii, 547.

[1] Bieter, Raymond N., *Am. J. Physiol.*, 1930, in press.