served in action correspond to the difference in concentration. Also, for a given degree of action the molecular concentration is not the same for all substances, and though the evidence has not yet been completely analyzed, it seems to be in general agreement at least, with the views of Meltzer and his pupils,[1] that the toxicity of solutions of salts that naturally occur in the blood varies inversely with the amount in which they are thus present.

90 (907)

The blood in "shock."

By **C. C. GUTHRIE** and **F. V. GUTHRIE** (by invitation).

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It has been stated that in conditions of "shock" concentration of the morphological elements of the blood may take place through outward passage of liquid from the blood vessels.[2]

This point was investigated in a rather comprehensive experimental study of "shock" in etherized dogs. This condition was induced by rhythmical Faradic stimulation of the brachial plexuses and moderate hemorrhage. In general, death occurred within one or two hours. Small samples of the blood were withdrawn at regular intervals and defibrinated. The specific gravities and freezing points of the blood specimens were measured in eight experiments. The results are practically the same in all cases, and show that under the conditions of the experiments, physical alterations in the blood are not greater than may be accounted for by the loss of blood and certainly are not such as could affect the circulation sufficiently to account for the phenomena observed.

Relative to the total mass of blood, the amount withdrawn was, in round numbers, between 15 and 30 per cent., the average being 25 per cent.—estimated on the total blood being 1/15 of the body weight.

The average arterial blood-pressure at the time the first blood sample was taken was 180.5; at the time of taking the last sample

[1] *Jr. Pharm. and Exp. Ther.*, 1909, I, 1.

[2] Malcolm, *Lancet*, 1905, II, 573; 1907, I, 497.

47 mm. Hg pressure. The average specific gravity of the first sample was 1.059; and of the last 1.056. The average change in freezing point was + 0.016.

Viscosity measurements were made in a few experiments. In this respect also there was insufficient evidence for attributing the clinical condition of the animal to mechanical change in the blood.

91 (908)

Laking of blood by hypertonic solutions.

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It is known that hypertonic solutions when added to blood may cause laking.[1] To determine if possible if this phenomenon could be due to a drying action on the scarlet blood discs, as this is known to so affect them that they lose hemoglobin to watery solutions even though such solutions are iso- or hyper-tonic to blood serum, experiments were performed to observe the action of hypertonic solutions of a number of relatively inert inorganic salts and other substances, including the chlorides of Na, K, Mg, Ca and Ba; the sulphates of Na, K, Mg; cane sugar and glycerine. For in drying through evaporation the salt content of the liquid surrounding the cells must become decidedly concentrated before all of the water has evaporated. The results of the observations may be summarized as follows:

1. Laking by hypertonic sodium chloride solutions or by hypertonic solutions of other inert salts is proportional to the concentration of the solution.

2. In hypertonic solutions of inert substances in equimolecular concentrations, laking is not the same in all. And consideration of the isotonic coefficients of such substances does not indicate that laking is altogether due to osmotic strength.

3. In equimolecular hypertonic concentrations, the chlorine salts are more powerful than the corresponding sulphates.

4. Non-electrolytic solutions, as cane sugar and glycerine, in hypertonic concentration produce laking, and it is proportional to the concentration of the solution.

[1] Bursy, Inaugural-Dissertation, Dorpat, 1863.