

## 3032

## The water depots of the body.

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It is well known that hemorrhage causes fluid to enter the blood from the tissues. Likewise it is well known that colloid-free fluids on injection rapidly leave the blood and pass to the tissues. It was the object of this study to determine, if possible, whether certain tissues are of more importance than others in these interchanges. The experiments were carried out on cats anesthetized with ether. The tissues chiefly worked with were skin (clipped free from hair), muscle, intestine, spleen, liver and blood. Both kidneys were ligated off. Corresponding parts on each side of the body were prepared and when all was ready, the small pieces from one side were snipped off and dropped into stoppered weighing bottles. Then the experimental procedure was performed and after thirty minutes the corresponding pieces from the opposite side of the body were taken. The samples were all dried to a constant weight at 102°. The experimental procedure consisted in a hemorrhage of 15 cc. per kilo or in the injection of 25 cc. of the various solutions per kilo. The calculations as to the amounts of the various tissues in the body of the cat were based on the figures of Voit.<sup>1</sup> The amount of blood in the cat was taken as 4.6 per cent of its weight and the amount of water entering or leaving the blood calculated from hemoglobin and hematocrit alterations.

The results are as follows: Following the hemorrhage all tissues examined gave up water, but of the amount of water entering the blood, about 78 per cent came from skin and subcutaneous tissue, 10 per cent from muscle, 8 per cent from the liver, 2 per cent from the intestine and .03 per cent from the spleen. The foregoing are the average of twenty-three experiments. The effect of intravenous injections may be seen from the following table:

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<sup>1</sup> Voit, Carl von, *Z. f. Biol.*, II, 1886.

TABLE I.

Fluid injected 25 cc. per kilo	Per cent injected fluid leaving blood in 30 min.	Percentage of fluid leaving blood entering				
		Muscle	Skin	Liver	Intestine	Spleen
*1. Distilled water	97.8	36.0	8.0	12.0	6.0	0.25
2. 0.45% NaCl	96.0	40.0	7.6	23.0	9.6	0.40
3. 0.6% CaCl <sub>2</sub>	93.7	37.8	12.0	25.2	13.2	0.30
4. 0.9% NaCl	58.0	0.0	30.0	19.0	8.0	0.50
5. 1.8% NaCl	46.0	0.0	27.0	Samples lost	10.0	0.20

\*1 is average of 10 experiments; 2, of 5; 3, of 5; 4, of 8; 5, of 6.

The table shows that with hypotonic solutions the fluid passes into all tissues; with isotonic solutions, however, little seems to enter muscle. In a few experiments not recorded in the table, stronger solutions of CaCl<sub>2</sub> were injected. It was found the fluid went chiefly into the intestine and the skin, the muscle actually losing fluid.

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### Storage of water in various parts of the earthworm at different stages of exsiccation.

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This study was made last December on 12 specimens of *Lumbricus terrestris*, recently obtained from Pennsylvania. When brought into the laboratory, the earthworms were kept 1 or 2 days barely covered with tap water until weight equilibrium was reached. The laboratory temperature during the experiment was nearly constant at 18° to 19° C., the extreme range being 16° to 20°.

*Changes in body weight.* Eight worms were exposed on dry filter paper, and weighed at frequent intervals. At various stages of exsiccation, they were replaced in tap water, to determine the rate of recovery in body weight. Two of the worms, after losing