

gout, one of acute infectious arthritis, one of acute rheumatic fever, and ten of chronic arthritis.

Positive intradermal reactions were observed in 2 out of 3 cases of serum sickness. Negative results were obtained in one case of chronic generalized eczema, one of subsiding urticaria of unknown etiology, and one of erythema multiforme.

Preliminary work indicates that following the subcutaneous injection of this proteose there is a marked increase in the leucocytes of the blood with a corresponding increase in the percentage of eosinophiles.

Further work upon the therapeutic efficacy of desensitization with this urinary proteose and the blood picture following its subcutaneous injection is in progress.

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The Movement of Substances in the Cerebrospinal Fluid.

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(Introduced by Harvey Cushing.)

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The authors undertook to determine and collate the glucose tolerance curves in 2 loci in the cerebrospinal system and in the blood, in the hope not only of establishing the relations of the absolute sugar levels but also of obtaining data on the movement of the cerebrospinal fluid itself or of substances dissolved therein.

To determine the carbohydrate tolerance curves a healthy adult dog was used for each experiment. After 18 hours' fasting, anesthesia was induced by intraperitoneal injection of sodium amytal (Lilly). With full surgical asepsis both cerebral hemispheres were exposed by a midline trephine opening so that either lateral ventricle could be tapped with a specially made brain needle. A cisternal needle was then introduced into the *cisterna magna* and left there throughout the experiment. Since the latest modification of Folin's micro-sugar method,¹ using unclaked blood, was used, it was necessary to obtain from each locus only 0.1 cc. of fluid for each determination. After obtaining simultaneously one sample from each point, 20 gm. of glucose were given by vein. Every 15 minutes

¹ Folin-Svedberg, *J. Biol. Chem.*, 1930, **88**, 77.

thereafter for a period of 2½ hours, samples were taken simultaneously from each locus.

Twenty-two experiments were performed. The following table summarizes the relevant essentials from experiments performed after the technique had been perfected.

TABLE I. *Summary of Relevant Findings.*

Dog No.	Blood			Ventricle			Cistern		
	Initial value	Peak value	Min. after glucose	Initial value	Peak value	Min. after glucose	Initial value	Peak value	Min. after glucose
17	117	358	5	103	198	15	102	187	54
18	89	400	5	—	—	—	—	—	—
19	104	323	5	102	156	15	79	152	68
20	123	386	5	120	200	15	117	208	37
21	129	312	5	—	—	—	—	—	—
22	80	267	5	80	—	—	80	140	45
Average	107	344	5	101	185	15	100	172	49
Mean deviation	±18	±50	5	±16	±24	15	±19	±29	±14

The data obtained appear to the authors to warrant the following tentative conclusions. These are derived for the most part from the average figures shown in Table I.

1. The relatively close approximation of the 3 initial sugar levels suggests that under stable fasting conditions the sugar level of the dog's cerebrospinal fluid equals that of the blood.

2. From the close time sequence of the maxima of the blood and ventricular sugar curves, it is evident that the ventricular fluid is affected by changes in the blood sugar level.

3. Comparison of the time relations of the maxima of the ventricular and cisternal sugar curves indicates that the cerebrospinal fluid is not in rapid motion. About 35 minutes elapsed between the peaks of the ventricular and cisternal curves. The average distance from the foramina of Monro to the tip of the cisternal needle was 41 mm. The velocity of the fluid is therefore in the order of 1 to 2 mm. per minute. This slow apparent displacement is the result of extraneous movements, such as coughing, sighing and deep breathing, imparted to the fluid and setting up currents within it. Since it is of a much lower order of magnitude, diffusion, *per se*, can not account for this movement.