TABLE.

PER CENT. REDUCING SUBSTANCE IN BLOOD OF VENA CAVA INFERIOR OPPOSITE ENTRANCE OF HEPATIC VEINS IN DOGS FED WITH EXCESS OF CARBOHYDRATE.

A. *Without Excision of Suprarenal.*

No. of Expt.	Before Stimulating.	During Stimulation.	After stimulation Removed.	Remarks.
16	0.136	0.176 (7 min.)[1]	0.184 (10 min.)[2]	
18	0.124	0.110 (7 min.)	0.144 (30 min.)	No rise in blood pressure.
19	0.130	0.176 (10 min.)	0.148 (30 min.)	
20	0.199	0.265 (5 min.)	0.415 (30 min.)	
21	0.151	0.195 (7 min.)	0.168 (23 min.)	
24	0.132 0.121 (30 min. later)	0.154 (7 min.)	——	
25	0.194 0.213 (30 min. later)	0.280 (5 min.)	——	
32	0.111 0.122 (30 min. later)	0.166 (9 min.)	——	

B. *After Removal of Left Suprarenal Capsule.*

27	0.118	0.124 (10 min.) 0.109 (25 min.)	——	
28	0.120 0.082 (30 min. later)	0.101 (5 min.) 0.103 (20 min.)	——	
29	0.171 0.173 (30 min. later)	0.177 (16 min.)	——	
30	0.163 0.127 (30 min. later)	0.113 (15 min.)	——	
31	0.249 0.248 (25 min. later)	0.270 (5 min.) 0.256 (20 min.)	——	

In every case, but one (no. 18) in which the suprarenal was intact there was a distinct increase in the reducing power of the blood, but when the suprarenal was exsected no increase occurred (except a slight transitory increase in no. 31). The blood pressure rose in all cases except no. 18.

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Comparison between the blood flow in the arm and in the hand.

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In 1909 the authors published a plethysmograph method for determining the rate of blood flow in the arm (Heart, I., 87) The results obtained by this method for normal individuals, partly

[1] The time periods in brackets indicate when the specimens of blood were removed in (1) after the beginning of stimulation; in (2) after the stimulation had been discontinued.

or completely stripped to the waist, under the ordinary conditions of room temperature, usually lay between 2 and 5 c.c. of blood flow per 100 c.c. of arm substance per minute. More recently, by a calorimeter method, G. N. Stewart has obtained rates in the hand approximately 10 c.c. of blood flow per 100 c.c. of hand substance per minute. We have attempted to compare the two methods because it seemed improbable to us that this discrepancy could depend entirely upon variations in external conditions, such as the room temperatures or the amounts of clothing worn.

The plethysmograph method was applied to the hand and the results compared with those obtained by the calorimeter method on the hand and with those obtained when the plethysmograph included the forearm and the lower arm. Our method does not give very satisfactory results for the hand. The curves are apt to rise abruptly when the pressure is applied and the rate of swelling remains constant but a short time before it lessens, owing apparently to the small venous capacity of the hand.

It is nearly always possible, however, to obtain curves where the rate of inflow is nearly constant for 2 c.c. or more. By selecting such parts of the tracings, an approximate rate of flow in the hand was obtained.

TABLE I.

	Average Room Temp.	Average Calorimeter Temp.	Rate by Calorimeter.	Plethysmograph Plate.			Remarks.
				Hand.	1st Arm.	2d Arm.	
Co.	24°	25.7°	3.1	4.8	2.9	3.1	Thick skin, hand cold.
Ca.	23°	29.8°	4.8	7.8	2.3	2.4	Hand cool.
So.	27.5°	29.0°	10.0	10.2	4.5	4.5	Hand warm.

In the experiments charted in Table I. the individuals were stripped to the waist. The rate of flow in the hand was first determined by Stewart's method. After this the hand was dried and successive determinations of the blood flow, by the plethysmograph, were made on the forearm, the hand, and again on the forearm. A glance at this table indicates that the blood flow in the hand was relatively faster than it was in the combined hand, forearm, and lower arm; and, furthermore, that the plethysmograph method, when applied to the hand, gave somewhat faster rates of flow than did the calorimeter method. In these experiments the plethysmograph contained air only.

In order to compare the two methods more closely a second series of experiments were performed in which the individual remained clothed and the hand, or arm, in the plethysmograph was covered with water of the same temperature as the water that had been in the calorimeter. The results of these experiments, shown in Table II., agree with the first set.

TABLE II.

	Average Room Temp.	Average Calorimeter.	Rate by Calorimeter.	Plethysmograph Rate.	
				Hand.	Arm.
V.Z.	24.5°	29.8°	7.4	9.6	
V.Z.	24°	28.0°	7.4	8.3	
V.Z.	25.5°	29.6°	4.7	8.6	3.1

These observations indicate that the blood flow in the hand, relative to its volume, is faster than is the flow in the combined forearm and hand. We found considerable differences in the results obtained by the two methods used on the hand. We do not know the exact causes of these differences but are inclined to believe that both hand methods are subject to greater error than is the plethysmograph method when applied to the arm.

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On the phagocytic inclusion of carmine particles by sarcoma cells growing in vitro with consequent staining of the cell granules.

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The cells of rat and mouse sarcomata when cultivated in vitro show active amœboid movements and wander for considerable distances into the surrounding plasma. Upon adding finely powdered carmine particles to the plasma medium the wandering tumor cells take up the particles in an active phagocytic manner. The carmine particles within the cells are easily distinguishable by their opacity and angularity. The carmine is partially dissolved within the cell and brings into evidence the granules of the