the 2 others it was slight but definite. One dog failed to show any detectable weakness. The results are summarized in Table I.

TABLE I.

Dog No.	1	2	3	4	5
Date of operation	2-27	2-27	4-9	4-9	4-9
Date of injection	3-8	3-18	5-9	5-9	5-9
Hemiplegia after operation	Yes	Yes	Yes	Yes	Yes
Hemiplegia after injection	No	"	Slight	Slight	"
General reaction	Yes	"	Yes	Yes	"

Other antigens, typhoid bacilli, egg-albumen, etc., are being employed in further experiments involving modifications of technic.

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Effect of Adrenalin on the Glucose and Lactic Acid Exchange of the Brain.

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It has been shown that the brain removes glucose and lactic acid from the blood stream in both normal and diabetic conditions (McGinty,[1] Himwich and Nahum[2]). Since it is not probable that storage of carbohydrates occurs, the substances thus removed must have an oxidative fate.

Adrenalin in adequate amounts is known to inhibit carbohydrate oxidations (Colwell and Bright,[3] Cori and Cori[4]). It might therefore alter the processes concerned with the removal of glucose and lactic acid. Dogs were used and blood samples were obtained from the superior longitudinal sinus and femoral artery simultaneously. The first experiment consisted of injecting adrenalin ½ cc. every 15 minutes for 6 hours. Blood samples were drawn every hour. Table I presents the results.

When adrenalin was injected in small divided doses in accordance with its well known action, it produced an appreciable increase in the glucose and lactic acid level of the blood. The brain under these

[1] McGinty, D. A., *Am. J. Phys.*, 1929, **88**, 312.

[2] Himwich, H. E., and Nahum, L. H., 1929, **90**, 389.

[3] Colwell, A. R., and Bright, E. M., *Am. J. Phys.*, 1930, **92**, 343.

[4] Cori, C. F., and Cori, G. T., *J. Biol. Chem.*, 1928, **79**, 309.

TABLE I.

Effect of repeated small doses of adrenalin on the glucose and lactic acid of the blood passing through the brain.

Dosage	Time	Glucose			Lactic Acid		
		Arterial	Cerebral	Diff.	Arterial	Cerebral	Diff.
½ cc.	injection						
every	1 hr. later	.131	.088	—43	12	12	0
¼ hour	2 " "	.129	.102	—27	27	18	—9
total	3 " "	.175	.150	—25	36	36	0
11 cc.	4 " "	.172	.120	—52	51	43	—8
	6 " "	.226	.190	—36			
	7 " "	.193	.166	—27	35	50	+15

conditions, however, continued its absorption of glucose from the blood stream throughout the period of the experiment. The lactic acid removal continued during the first 4 hours, following which there was a reversal of the process and from this point on, the brain liberated this substance in appreciable amounts.

TABLE II.

Effect of repeated large doses of adrenalin on the glucose and lactic acid of the blood passing through the brain.

Dosage	Time	Glucose			Lactic Acid		
		Arterial	Cerebral	Diff.	Arterial	Cerebral	Diff.
5 cc	injection						
every	1 hr. later	.093	.076	—17			
½ hour	1 " 35 min. later	.112	.093	—19	44	58	+14
total	2 " 15 " "	.204	.183	—21	58	72	+14
35 cc.	2 " 45 " "	.286	.282	—4	39	51	+12
	3 " 15 " "	.290	.296	+6	69	79	+10

With larger doses of adrenalin both the glucose and lactic acid of the blood rose more rapidly to much higher levels. In the first 3 observations the brain continued to absorb glucose in appreciable amounts. Finally this process ceased when enough adrenalin had been injected to raise the glucose level of the blood to about 290. With regard to lactic acid, it is apparent that throughout the course of this experiment the brain liberated this substance in considerable amounts. In the first 3 observations the glucose removed exceeded the lactic acid liberated. Apparently, not all the glucose absorbed disappeared through glycolysis. It is evident that adrenalin reveals the ability of the brain *in situ* to glycolyse.