TABLE I.

Day and hour	Mouse A		Mouse B	
	Feces, mg	Clotting-time min	Feces, mg	Clotting-time
1st 900	3	1½	45	1½
" 1500	47	>10	65	>10
2nd 900	13	>10	110	>10
" 1600	68	>10	84	1½
3rd 900	41	4	64	1⅓
5th 900	136	1½	132	1⅓

Heparin in mice is not absorbed from the alimentary tract by the animal organism, but is excreted undisturbed with the feces in the course of about 2 days.

10807

Coagulation Time of Blood in Normal and Adrenal-Demedullated Rats.

DWIGHT J. INGLE* AND WARREN C. CORWIN.† (Introduced by F. D. W. Lukens.)

From the Wistar Institute of Anatomy and Biology, Philadelphia.

Vosburg and Richards,[1] von den Velden,[2] Cannon and Gray,[3] Cannon and Mendenhall,[4] and Mendenhall,[5] have presented evidence that adrenalinemia hastens the coagulation time of blood. Nice, Irwin and Kraft[6] observed that there was a decrease in the clotting time of blood following emotional excitation in normal rats and that this decrease was largely abolished by adrenalectomy. They concluded that this difference between normal and adrenalectomized rats was due to the loss of the adrenal medulla. In their experiment the samples of blood were obtained under ether anesthesia. Mendenhall[5] observed that coagulation processes were hastened by ether anesthesia.

* Medical Research Fellow, The George S. Cox Medical Research Institute, University of Pennsylvania, Philadelphia.

† Instructor, Department of Pathology, Jefferson Medical College, Philadelphia.

1 Vosburg, D. H., and Richards, A. N., *Am. J. Physiol.*, 1903, **9**, 35.

2 Von den Velden, R., *Therap. Monatschr.*, 1911, **25**, 279.

3 Cannon, W. B., and Gray, H., *Am. J. Physiol.*, 1914, **34**, 232.

4 Cannon, W. B., and Mendenhall, W. L., *Am. J. Physiol.*, 1914, **34**, 243.

5 Mendenhall, W. L., *Am. J. Physiol.*, 1915, **38**, 33.

6 Nice, L. B., Irwin, O. C., and Kraft, R. M., *Am. J. Physiol.*, 1931, **96**, 305.

In this investigation we have compared normal and adrenal-demedullated rats in respect to changes in the clotting time of whole blood following ether anesthesia and following emotional excitation in the unanesthetized state.

Methods. Fifty albino male rats weighing 190-310 g were closely matched into pairs on a weight basis. One animal of each pair was subjected to bilateral enucleation of the adrenal glands by the method of Evans.[7] A minimum period of 60 days was allowed for the regeneration of the adrenal cortices of the operated rats.

The rat was emotionally excited by holding it on its back by means of rubber bands attached to each leg. The animal was then induced to struggle continuously by means of gentle probing with blunt instruments. In order to obtain a sample of blood the tail of the animal was placed against a cork board, a sharp razor blade was held against the tail and struck a light blow with a mallet. This served to excise the tip of the tail with a minimum crushing of the tissue. The tail usually bled freely and after discarding the first few drops a drop of as near a uniform size as possible was selected for observation. Coagulation times were determined by means of a Boggs' coagulometer. A minimum period of 2 weeks was allowed to elapse between experiments which involved the same animal. In each experiment a normal and a demedullated animal were run as pairs according to the original matching. The experimenter who made the observation on the coagulation time was not aware of the identity of the animal from which the sample of blood was taken.

In Experiment 1, 10 pairs of rats were subjected to emotional excitation for 10 minutes. Samples of blood were taken immediately before and immediately following the period of excitation. The average changes in the coagulation time of blood were small for each group and were statistically insignificant. In Experiment 2, 10 pairs of rats were subjected to emotional excitement for 20 minutes. The average coagulation time of the blood was decreased for each group but the changes were not statistically reliable. In Experiment 3, 10 pairs of rats were anesthetized with ether. Samples of blood were taken before the anesthetic was administered and 20 minutes after the beginning of anesthesia. A marked decrease in clotting time was found for both normal and adrenal-demedullated rats. The changes were statistically significant for each group. The group averages with the ratio between the difference and the standard deviation of the difference expressed as t. are summarized in Table I.

Adrenal-demedullated rats responded like normal rats in respect

[7] Evans, Gerald, *Am. J. Physiol.*, 1936, **114**, 297.

TABLE I.
Coagulation Times of Normal and Adrenal-Demedullated Rats.
Each figure represents the average of 10 animals.

	Normal				Demedullated			
Experiment	Initial sec	Final sec	Diff. sec	t*	Initial sec	Final sec	Diff. sec	t*
10 min excitation	138.0 ±6	142.0 ±5	+ 4 ± 7.8	0.51	151.0 ±7.2	136.0 ±12.6	—15.0 ±14.4	1.04
20 min excitation	121.2 ±9	93.0 ±6	—28.2 ±11.4	2.5	108.0 ±3.6	91.2 ±8.08	—16.8 ± 8.8	1.9
20 min ether	136.2 ±.72	99.0 ±10.2	—37.2 ±12.3	3.02	138.0 ±6.0	76.2 ±11.4	—61.8 ±12.9	4.8

* A value for t of 3 or greater meets the usual requirements for statistical reliability.

to changes in the coagulability of blood following emotional excitation and following ether anesthesia. A considerable variability in normal values for coagulation time was noted. It is quite possible that the variability was due in part to experimental errors inherent in the technic used by us. This variability may have masked small differences in the response of our 2 groups of animals but we believe that marked differences in the coagulation time of blood cannot be produced in the rat by adrenal demedullation. This problem should be studied in larger animals, thus permitting the use of venous blood. Only then can the variations due to differences in thromboplastin content and rate of blood flow be eliminated. It would also be preferable to use one of the electrocoagulometers now available on the market.

Summary. Adrenal-demedullated rats responded like normal animals in respect to the coagulability of blood following emotional excitation and following ether anesthesia.‡

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