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Effect of Cortin on the Nervous System in Adrenal Insufficiency.*

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The outstanding symptom in adrenal insufficiency is asthenia. It has been shown experimentally by Gans and Miley,[1] who used a nerve muscle preparation, that only 1/16th of the work done in normal rats could be performed in adrenalectomized rats. They did not show whether the seat of this fatigue was in the myoneural junction or in the muscle itself. Certain clinical observations which we have made recently indicate that the nervous system, even the higher centers, may be involved in the fatigue of adrenal insufficiency.

In the present investigation, we have studied the effect of cortin on the reflex as well as the peripheral structures. Albino rats of the same strain were adrenalectomized and kept under identical conditions. These were divided into 2 series and matched according to weight and sex. The first series was injected twice daily with ½ cc. of cortical extract (40 gm. per cc.), while the other series was injected at the same times with the same volumes of isotonic saline. Beginning 2 days after operation the resistance to fatigue was compared with animals from the 2 series. Amytal was used for anesthesia. The spinal cord was cut just below the diaphragm. Electrodes were placed in contact with the central portion of the sciatic nerve on the right side after it had been dissected free and cut. A second pair of electrodes was placed in contact with the sciatic on the left side. The tendon of the left gastrocnemius was attached to a muscle lever fastened to a scale pan which was after-loaded with a 100 gm. weight. This muscle was pre-

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[1] Gans and Miley, *Am. J. Physiol.*, 1927, **82**, 1.

pared for direct stimulation by wires fastened to the tendon and to the origin of the muscle. Care was taken to prevent drying of the nerves and muscle. Supermaximal stimuli were used in every instance. An automatic interrupter which completed the primary circuit, about 3 times a second furnished the stimulus. Both make and break shocks were used. The right sciatic was stimulated until the left gastrocnemius failed to give further contractions, upon which the stimulus was immediately switched to the right sciatic. When the left gastrocnemius again failed to respond, the muscle was directly stimulated. This arrangement enabled us to determine the fatigue time of the reflex arc, myoneural junction and the muscle itself.

The average times of completed tests are given in Table I.

TABLE I. *Average Time Required for Fatigue.*

Series	No. of cases	Reflex (min.)	Myoneural Junction (min.)	Muscle (min.)
Cortin	10	124	234	255
NaCl	9	19	37	43

The difference in the 2 series is significant, since the cortin series required 6 times as long to fatigue in every instance.

There is evidence that more frequent injections of cortin will increase the difference between the 2 series, but the number of animals used is too small to draw any further conclusions.

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The Recovery Oxygen Consumption of Muscles Poisoned with Brom-acetic Acid.

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Lundsgaard[1] reported that the resting oxygen consumption of the intact frog was unimpaired by brom-acetic acid poisoning while glycolysis was completely inhibited. Fischer[2] using electrical stimulation was unable to find a recovery heat production in isolated frog muscle poisoned with 0.05 to 0.1% brom-acetic acid. Heg-

[1] Lundsgaard, E., *Biochem. Z.*, 1930, **227**, 51.

[2] Fischer, E., *Pflüger's Arch.*, 1931, **226**, 500.