VI. Four adult animals, consisting of one non-pregnant female and three males, were kept at an average temperature of 30° C. throughout the experiment. The average survival period was 194.1 hours. No food or fluids of any kind were forced upon the cats of experiments V and VI.

The conclusion seems evident that the average survival period for bilaterally epinephrectomized cats, when they are not subjected to repeated bleeding for blood tests, is in the neighborhood of 4 to 6 days. When double operated cats are bled repeatedly, especially after adrenal insufficiency symptoms develop, the period of survival is very materially shortened. Swingle[2] has recently reported that the blood findings (pH, CO_2 capacity, phosphorus, etc.) of cats surviving bilateral adrenal removal (4 to 6 days) are identical with those showing symptoms at sixty hours.

This is a preliminary report.

[1] Corey, E. L., PROC. SOC. EXP. BIOL. AND MED., 1926, xxiv, 206.
[2] Swingle, W. W., *Am. Naturalist*, 1927, lxi, 132.

3568

Effects of Pituitrin Administration on Distribution of Injected Fluid.

C. E. LEESE, H. R. JACOBS AND H. M. HINES.
From the Department of Physiology, State University of Iowa.

Although it is well known that the administration of extracts of the posterior lobe of the pituitary gland may affect blood volume and urine output, there is little agreement as to the mechanism involved. This is due in part to the varying dosages, modes of administration, time of observation, and condition of the experimental animal employed by the various investigators.

The purpose of this investigation was to study the effect of pituitrin administration on the distribution of injected fluid between the blood, urine and tissues. Normal dogs deprived of food and water for 20 hours were used as experimental animals. Ringer's solution was injected intravenously by means of a Woodyatt pump, for a period of two hours, at the rate of either 15 or 25 cc. per kilo body weight per hour. At times, from .05 to .08 cc. of commercial pituitrin (Parke, Davis & Co. or Eli Lilly & Co.) per kilo body weight per hour was added to this solution. Ether was administered by the open cone method in several experiments, in order to study the

combined effects of pituitrin and anesthesia. The periods of observation included the two hours of injection and a post-injection period of three hours. Urine was collected by continuous catheterization. Blood was drawn from the jugular vein before, at the end of the injection, and at the close of the post-injection periods. Blood volume increases were calculated from the Hb. and serum protein changes. For comparative purposes 7 per cent of the body weight was considered the average preliminary blood volume. The small volume of urine that the animals would have passed without fluid injection has been neglected in these calculations. The percentage of injected fluid entering the tissues was calculated from the difference between the amount injected and that found to be in the blood and urine.

TABLE I.
Distribution of Fluid Injected.

Nature of Injection	Percentage excreted during injection period	Percentage found in blood stream*	Percentage calculated to enter the tissues*	Percentage excreted in three hour post-injection period
Avg. Ringer's	22.3	25.7	52.0	29.9
Avg. Ringer's and pituitrin	23.1	56.4	20.5	55.7
Avg. Ringer's and pituitrin and ether anesthesia	26.9	9.2	63.9	30.9
Experiments on 2 Nephrectomized Dogs.				
Avg. Ringer's	0	25.8	74.2	0
Avg. Ringer's and pituitrin	0	61.6	38.4	0

*At end of injection period.

Table I summarizes the average values obtained in 24 experiments on 10 animals. The effect of pituitrin administration has been to decrease greatly the amount of fluid entering the tissues. Ether anesthesia is antagonistic to this action and permits even greater quantities of fluid to be distributed to the tissues than in the control experiments with Ringer's solution. The values obtained in the different experiments were consistent, in that animals receiving pituitrin exhibited a greater increase in blood volume than the controls. This confirms the findings of Underhill and Pack[1] and other investigators. Approximately the same degree of difference was noted in experiments on nephrectomized animals. When the injections were made under ether anesthesia only a slight increase in blood volume was noted. Pituitrin administration was found to be without effect on the urine output during the injection period, but was followed by a greater output in the three hour after-period. We believe the lat-

ter effect to be due, not to the action of pituitrin *per se,* but rather to the increased fluid content of the blood present at the time pituitrin administration ceases.

This is a preliminary report.

[1] Underhill, F. P., and Pack, G. T., *Am. J. Physiol.*, 1923, lxvi, 520.

3569

A Comparative Study of the Extent of the Knee-jerk and the Achilles-jerk.

W. W. TUTTLE. (Introduced by J. T. McClintock.)

From the Department of Physiology, State University of Iowa.

In this investigation the extent of the knee-jerk is compared with the extent of the Achilles-jerk. Apparatus has been devised which is capable of automatically delivering stimuli of uniform intensity, at a constant rate, to both the *ligamentum patellae* and the tendon Achilles.

In case of the knee-jerk, the subjects were seated in an adjustible chair so that they could be placed in proper proximity to the stimulating hammer. The leg was attached to a movable stylus, suspended from a rubber band, which records the lateral movement on a revolving drum. In all cases a constant leverage was maintained by keeping the point of attachment to the leg at a uniform distance of 30 cm. from the inferior margin of the *ligamentum patellae.* The details of the technique may be found elsewhere.[1]

For the Achilles-jerk experiments, the subjects were placed in a prone position on a well padded table, equipped so that the leg in question could not move. The apparatus is so devised that a stimulating hammer falls upon the tendon Achilles ten times per minute with a force of 296 grams. The extent of the movement of the toe is recorded by connecting it to a moveable stylus, as previously described. A constant leverage was maintained by keeping the point of attachment of the toe 26 cm. from the *malleolus medialis.*

The extent of the jerks was obtained by measuring the distance in millimeters through which the stylus moved when they were elicited. This distance is referred to as the "extent" or "height" of the jerk.

In this investigation 115 normal subjects were used. The data obtained from 95 subjects are shown in condensed form in Table I.