the slow nor the quick components of the nystagmus were disturbed by decerebration at a level which passed through the superior colliculi dorsally and the mammillary body ventrally. The direction and intensity of the nystagmus remained within normal limits.

Lesions in the right half of the cerebellum did not modify the post-rotatory nystagmus, either alone or in conjunction with decerebration.

9708 P

Epinephrine Secretion in Hypophysectomized Dogs.

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Our investigation arises from the supposed relation of the adrenal glands to the etiology and pathology of diabetes and of hypertension. This report concerns the probable interrelated functions of the adrenals and the hypophysis, in relation to these conditions.

Anatomic changes have been found in the adrenals after hypophysectomy and in the hypophysis after adrenalectomy. The adrenal cortex undergoes marked atrophy following hypophysectomy although the medulla shares but little, if at all, in this change. Extracts of the posterior lobe of the hypophysis have been reported to be capable of inducing hyperplasia of the adrenal cortex.[1] An interrenalotropic principle, capable of affecting the adrenal cortex, has been obtained from the anterior lobe of the hypophysis and an adrenotropic action of hypophyseal extracts, affecting the medulla, has also been reported. It has been claimed[2] and also denied[3, 4] that the hypertensive action of posterior pituitary extract depends upon free circulation of blood from the adrenals.

If an adrenal medullotropic function is performed by the hypophysis, it seems probable that hypophysectomy would result in a diminished rate of liberation of epinephrine from the adrenal glands. It might also be expected to affect the production or storage of epinephrine in the adrenals, as a result of loss of the hypophyseal

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1 Hallion, L., et Alquier, L., *Compt. rend. Soc. Biol.*, 1908, **65**, 5.

2 Képinov, L., *Compt. rend. Soc. Biol.*, 1920, **83**, 1134.

3 Hoskins, R. G., and McPeek, C., *Am. J. Physiol.*, 1913, **32**, 241.

4 Houssay, B. A., *Compt. rend. Soc. Biol.*, 1921, **85**, 35.

adreno-medullotropic hormone. Houssay and Mazzocco[5] found an increase in the epinephrine content per gram of adrenal, in hypophysectomized dogs. However, they point out that the increase is not absolute since it corresponds with the diminution of adrenal weight.

Képinov[6] concluded that the epinephrine output from the adrenals is greater in hypophysectomized than in normal dogs. His determinations were not quantitative for epinephrine secretion; he compared the vasoconstrictor action of adrenal vein blood from normal and from hypophysectomized animals, by perfusion through the isolated ear of the rabbit (Pissemski's method), but made no determinations of the actual quantity of epinephrine in the blood or of the amounts liberated by the adrenals.

We made quantitative determinations of the rate of liberation of epinephrine from the adrenals in 21 hypophysectomized dogs. The rate of epinephrine secretion was determined by the method of Stewart and Rogoff, and in 2 of the experiments the results were confirmed by another method described recently by Rogoff.[7]

Two acute and 19 survival experiments were performed. In the acute experiments the rate of liberation of epinephrine before and after hypophysectomy was determined. No significant difference was found, the epinephrine output being the same as in normal dogs.

Of the 19 survival experiments, 10 dogs were completely hypophysectomized; in 1 animal only the anterior lobe was removed; in 4 dogs a portion of the hypophysis was left; in 2 animals the stalk was partly severed and in the remaining 2 the stalk was completely severed but the hypophysis was left resting on the sella turcica. Determination of the rate of epinephrine secretion in the different animals was made at various intervals, ranging from 2 to 162 days after hypophysectomy.

Marked atrophy of the adrenals was observed in the animals that were allowed to survive longer than about a month. It appeared that the reduction in adrenal weight reaches a certain maximum, probably corresponding to the minimum amount of cortex required by the animal plus the weight of the medulla. Regardless of the weight of the animal, in the experiments that were completed about 3 to 5 months, or more, after hypophysectomy, each adrenal weighed approximately 0.3 gm. This is about 1/2 to 3/5 of the average weight

[5] Houssay, B. A., et Mazzocco, P., *Rev. de la Soc. Argent. de Biol.*, 1933, **9**, 220.

[6] Képinov, L., *Compt. rend. Soc. Biol.*, 1936, **122**, 351.

[7] Rogoff, J. M., PROC. SOC. EXP. BIOL. AND MED., 1937, **36**, 441.

for normal dogs, as observed from a large series (unpublished) of animals. Obviously, the capacity of the atrophied adrenal cortex to secrete the indispensable hormone, "interrenalin," is not materially altered by hypophysectomy, since animals surviving a relatively long time show no pathognomonic evidence of adrenal insufficiency.

In most instances the rate of blood flow from the adrenals was decidedly lower than is usually found in normal dogs. This might be accounted for by the atrophic changes in the adrenals induced by hypophysectomy. The epinephrine concentration in the adrenal vein blood was correspondingly greater. This can explain the results obtained by Képinov. An increased concentration of epinephrine in the adrenal vein blood, however, does not indicate an increased rate of secretion unless the rate of blood flow from the glands is not diminished.

Our experiments lead to the conclusion that the rate of epinephrine secretion from the adrenals, in dogs, is not significantly altered by hypophysectomy. Certainly, such alterations in the epinephrine output as would correspond with amounts of epinephrine necessary to have an important influence on blood sugar or on blood pressure, did not occur.

9709

Structure and Function of the Peritoneal Funnels* of the Frog, *Rana pipiens.*

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Heidenhain[1] found no trace of peritoneal funnels in the frog's kidney. Spengel[2] first saw these funnels in such forms as *R. temporaria, B. cinereus, D. pictus,* and Bombinator. He claimed that in the Coecilia and Urodela there was a connection between these

* Since the term "nephrostome" refers specifically to the funnel of a nephridium, the term "peritoneal funnel" is used here to designate the adult structure described without implying its origin, or its tubular connection with either the nephrocoel or hæmocoel. In this way there need be no confusion as to the adult structure found in the Anura or Urodela.

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1 Heidenhain, R., *Arch. f. Mikr. Anat.*, 1874, **10**, 1.

2 Spengel, J. W., *Zentrlblt. f. d. med. Wissensch.*, 1875, No. 2.