



FIG. 1.

Effect of thyroidectomy and of thyroid and dinitroresol administration on daily urine output of polyuric dog.

urine output, although not to the normal level; in the course of a few months the output slowly declined to normal. The transitory polyurias of hypophysectomy (removal of anterior lobe, pars intermedia, infundibular process and part of stalk) or of stalk section are usually immediately abolished by thyroidectomy. The high and permanent polyurias of complete hypophysectomy, including pars tuberalis and median eminence, may be unaffected by thyroidectomy (unpublished observations). We believe that the extent of the effect of thyroidectomy on the polyuria is proportional to the residual amount of pitressin-forming tissue.

Summary. The diuretic action of thyroid synergistic with anterior lobe is probably not due to its effect in elevating metabolic rate, as is indicated by the finding that a dosage of DNC producing a similar elevation of BMR has no diuretic effect.

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Adrenal Weights in Tumor-Bearing Rats.*

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The adrenal cortex has repeatedly been shown to be implicated in response of the body to toxins and infections. (Lewis,¹ Perla and

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¹ Lewis, J. T., *Am. J. Physiol.*, 1923, **64**, 506.

Gottesman,² Biebl,³ Zwemer,⁴ Bracci-Torsi,⁵ Baker and Hinmann,⁶ and others.)

We reported¹¹ a diminished resistance in hypophysectomized animals to doses of cobra venom and postulated that the effect was due to adrenal atrophy. We attempted at the time to increase the resistance of these animals by administration of adrenal cortex extracts but were unable to obtain satisfactory results. This failure was due in part at least to the very acute and crucial manifestations of cobra venom poisoning. Later Perla and Rosen⁷ were able to demonstrate the restorative action of adrenal cortex extract in hypophysectomized animals subjected to histamine poisoning.

In a cancer experiment involving intact and hypophysectomized animals bearing Walker No. 256 tumors, it was noted that the adrenals enlarged in the intact tumor-bearing animals above the normal size, while in the hypophysectomized animals the usual adrenal atrophy was present. The enlargement of adrenals in the intact animals is presumably either a result of absorption of toxic products of tumor necrosis or of the changed general metabolism of the body. Tumor necrosis was present also in the tumors of the hypophysectomized animals but the adrenals were not enlarged. The increased size can not then be due to a simple direct action of the toxins on the adrenals. The findings suggest that the pituitary is essential to this type of compensatory enlargement. Table I presents the values obtained.

TABLE I.
Adrenal Weights in Male Rats.

	No.	Body Wt	Wt of Adrenals, g
Normal	27	165 ± 4.5	.0301 ± .0007
Intact, with Walker No. 256 tumors	14	159 ± 3.5	.0560 ± .0023
Hypophysectomized	13	131 ± 3.2	.0148 ± .0007
Hypophysectomized, with Walker No. 256 tumors	10	161 ± 1.7*	.0160 ± .0006

*Weights before operative procedures.

Histological studies indicate that the enlargement of the adrenals in the intact tumor-bearing animals is not due to the myeloid infil-

² Perla, D., and Gottesman, J. M., *PROC. SOC. EXP. BIOL. AND MED.*, 1930, **28**, 474.

³ Biebl, M., *Z. f. d. ges. exper. Med.*, 1933, **91**, 662.

⁴ Zwemer, R. L., *Am. J. Path.*, 1936, **12**, 107.

⁵ Bracci-Torsi, C., *Gior. d. med. prat.*, 1936, **18**, 59.

⁶ Baker, D. D., and Hinmann, E. H., *J. Trop. Med.*, 1936, **39**, 117.

¹¹ Ball, H. A., and Samuels, L. T., *PROC. SOC. EXP. BIOL. AND MED.*, 1932, **30**, 26.

⁷ Perla, D., and Rosen, S. H., *Arch. Path.*, 1935, **20**, 222.

trations reported by McEuen and Selye⁸ and Lewis⁹ to accompany this tumor, but consists primarily of an increase in the cytoplasm and number of cortical cells and an increase in lipoid content. This would correspond to the "prolonged activity" type of Zwemer.⁴

Higgins and Cragg¹⁰ have reported hyperplasia of the adrenals similar to that observed by us in rats chronically poisoned with carbon tetrachloride. This was associated with atrophy of the gonads. These authors were not able to determine from their experiments whether this was due to a pituitary effect or to direct toxic actions. If the effect is similar in origin to ours we must assume that pituitary secretion is involved.

Conclusion. The presence of the hypophysis is necessary to adrenal hypertrophy in animals bearing Walker No. 256 tumor. This finding suggests that the pituitary may be essential to any adrenal cortex hypertrophy. Either certain toxins or metabolic processes sensitize the adrenal tissues to the pituitary adrenotropic hormone or they act directly on the hypophysis itself to cause an increased output of this substance. Work is now in progress to determine which process is involved.

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Atrophy of the Thymus in Normal and Hypophysectomized Rats Following Administration of Cortin.

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Moon¹ noted atrophy of the thymus in rats following administration of the adrenotropic principle of the anterior lobe of the pituitary glands. His observations have been confirmed by Lyons and Simpson of the same laboratory.²

This investigation deals with the effect on the thymus of administering massive amounts of cortin to normal rats and to rats which had been hypophysectomized. Forty male rats, each having an

⁸ McEuen, C. S., and Selye, H., *Am. J. Med. Sci.*, 1935, **189**, 423.

⁹ Lewis, M. R., *Am. J. Cancer*, 1937, **30**, 95.

¹⁰ Higgins, G. M., and Cragg, R. M., *Proc. Staff Meet. Mayo Clinic*, 1937, **12**, 582.

¹ Moon, H. D., *Proc. Soc. Exp. Biol. and Med.*, 1937, **37**, 34.

² Evans, H. M., personal communication to the author.