not total. They seem also rather stable: brains used after a 10 months storage at − 20° C. were found still to possess the properties described.

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Effect on the Thyroid Gland of Protracted Administration of Posterior Hypothalamic Extracts

As a follow-up of our investigations of the neurosecretory function of diencephalon[1] we have examined the effect on the histophysiology and respiratory function of the thyroid glands of rats of protracted administration of extracts of different regions of the hypothalamus and of the cortex.

Table 1. Effect of Extracts of Posterior Hypothalamus on the Thyroid Gland of White Female Rats

	Treatment	mgm./100 gm.	P	Thyroid gland Acinar cell height*	P	$K^{131}I$ intake (24 hr.)†	P
(I)	Rat cortex (10)	9·70±0·43	<0·01	5·04±0·17	>0·05	—	—
	post. hypoth. (10)	13·41±1·09		5·95±0·54			
(II)	Cattle cortex (11)	11·37±0·26	=0·01	4·85±0·14	<0·01	—	—
	post. hypoth. (4)	18·10±2·48		6·65±0·55			
(III)	Rabbit cortex (8)	10·61±0·50	<0·01	—	—	31·51±2·42	=0·02
	post. hypoth. (7)	14·07±0·71				22·66±2·50	

(I) 0·1 per cent extract; daily dose, 1·0 ml.; length of treatment, 14 days.
(II) Filtrate of 25 per cent homog.; daily dose, 1·0 ml.; length of treatment, 14–26 days.
(III) Extract containing 1/6 of posterior hypothalamus for one day. Length of treatment, 14 days.
* In units of ocularmicrometer 100 cell/thyroid gland.
† Activity of 10 mgm. tissue of thyroid gland in per cent of injected activity.

Daily administration for at least a fortnight of a physiological saline extract obtained from the posterior hypothalamus of rats, cattle and rabbits increased, statistically significantly, the weight of the thyroid gland of white adult female rats, kept on a standard mixed diet. This effect was not obtained by administration of saline extracts of the cortex. Quantitative examination of the height of thyroid acinar cells has shown an increase which was in the second experiment significant and in the first nearly so. The administration of an extract obtained from the anterior or medial part of the hypothalamus did not produce such a reaction. The increase of weight of the thyroid gland is not accompanied by an increased ability to concentrate iodine, and even the intake of radioactive iodine in 24 hr. is, referred to the unit of weight, lower than in the group treated with cortical extract (Table 1). The administration of posterior hypothalamic extracts, after previous treatment with thyrotropic hormone ('Ambinon'), impeded the decrease in weight of the thyroid gland to the normal size. The decrease in the height of acinar epithelium was moderately influenced by this treatment. Changes in the thyroid gland induced by previous treatment with 4-methyl-2-thiouracil (a 0·15 per cent diet for 15 days) were not influenced significantly by administration of a suspension of the posterior hypothalamus.

Administration of prepared suspensions of the brains of old rats (0·8 per cent), continued for a fortnight, did not cause any difference in the function of the thyroid gland. Treatment of infantile rats with a suspension of posterior hypothalami of rats (a daily dosage of an animal containing one-third of the posterior hypothalamus) for six days resulted in narrower acini which contained less colloid and had a higher epithelial lining as compared with the group treated with a cortical suspension. The increase in height of the acinar cells and the decrease of the acinar diameter is equally significant ($P < 0·01$, $P < 0·05$). In this experiment there was no difference in weight.

A systematic investigation of supposed diencephalic neurohumoral mediators affecting the thyroid gland has been initiated by other authors[2–5]. Ottaviani and Azzali[5], having injected a lipoid fraction of diencephalic extracts of cattle into dogs and hamsters for a variable period, noted in the case of low doses a histological picture which signified an increased secretory activity of the thyroid gland, and in the case of high doses a colloid storage. Shibusawa *et al.*[6] isolated from the raw extract of the urine an active thyroid-stimulating hormone, thought to be of anterior hypothalamic origin; and Schreiber *et al.*[7] demonstrated a hypothalamic factor, increasing the acid phosphatase activity of the thyreotrophic cells of the anterior pituitary.

Our own results indicate a hypothalamic factor appearing to be concentrated in the posterior hypothalamus, affecting the function of the thyroid even of infantile animals, which, however is considerably decreased or has even disappeared in old rats. From these results it may be supposed that this hypothalamic factor is distinguished from the TRF demonstrated by Shibusawa *et al.* not only by its localization but also by the fact that it decreases the intake of iodine simultaneously with increasing the weight of the thyroid gland. We do not think it likely that an effect which would primarily aim at the cortex of the adrenal gland would be based on adrenocortical-thyroid antagonism, because we have observed some adrenocortical stimulation only after administration of more concentrated anterior hypothalamic extracts without changes in the thyroid gland. At present we venture to suppose an inhibitory effect which seems to be similar to that of goitrogenic agents.

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