

Dr. I. Eryetishir and Mrs. R. Shacklock for some of the blood-pressure readings.

F. HORACE SMIRK  
WILLIAM H. HALL

Department of Medicine and the Animal Department,  
University of Otago Medical School,  
Dunedin, New Zealand.

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### Influence of the Thymus upon the Reaction of the Rat to Anterior Pituitary Growth Hormone

A RELATION between the thymus and the growth hormone of the anterior pituitary has been assumed by many authors. It is known that injections of this hormone result in an enlargement of the thymus<sup>1</sup>. A more thorough investigation of the interaction between these two glands seemed of interest.

80 male rats of 130–160 gm. were used. They came from a local inbred strain. The animals were divided into the following groups: (A) 20 animals were hypophysectomized by the method of Smith, as described by Farris and Griffith<sup>2</sup>; (B) 60 animals were thymectomized by the method of Segaloff<sup>3</sup> and hypophysectomized 8 days later.

Following hypophysectomy, the animals were kept at a constant temperature of 29° C. Growth was recorded for 15 days by daily weighing to the nearest 0.5 gm. The hormone injections were begun the 16th day after hypophysectomy: (a) the 20 hypophysectomized animals received daily injections of a commercial growth hormone preparation at daily doses of 0.5, 1.0, 2.0, 3.0 and 4.0 Evans units (4 animals at each dose); (b) 20 animals from the thymectomized and hypophysectomized group received the same injections; (c) 20 thymectomized and hypophysectomized animals were injected daily with the thymus preparation of Bezssonoff and Comsa<sup>3</sup> at daily doses of 5, 10, 20, 35 and 50 guinea pig units<sup>4</sup> (4 animals at each dose); (d) 20 thymectomized and hypophysectomized animals were injected similarly with the same thymus preparation. The thymus injection was followed immediately by an injection of growth hormone at a dose of 2.0 Evans units in all animals. The injections were continued for 15 days with daily weighing.

During the 15 days between hypophysectomy and the first hormone injection, weight loss was constant in all animals. It amounted to about 12 gm. in both groups (1 and 2).

The results during the hormone-injection period are shown in Tables 1 and 2. It can be seen that: (1) in group A the growth-rate under the influence of the same dose of growth hormone was significantly smaller than in group B. (2) Thymus extract injections

Table 2. INFLUENCE OF DAILY INJECTIONS OF THYMUS EXTRACT UPON THE GROWTH-RATE OF THYMECTOMIZED AND HYPOPHYSECTOMIZED RATS

Thymus daily dose (units per rat)	Weight difference after 15 days of daily injections (gm., arithmetical average of three animals)	
	C Injected with thymus only	D Injected with thymus and 2.0 units of growth hormone
0	-12.0 ± 1.0	+11.5 ± 2.0
5	-8 ± 0.8	+30.0 ± 4.0
10	0	+45.0 ± 7.0
20	-0.5 ± 0.2	+58.0 ± 6.0
35	-3.0 ± 0.5	+64.0 ± 6.4
50	-1.5 ± 0.6	+80.0 ± 4.8

alone had no real influence upon the growth-rate of group 2 animals. The loss in weight observed in the preperiod ceased following the thymus injections, but no proper growth was observed. (3) The simultaneous injection of thymus extract and 2.0 Evans units of growth hormone resulted in a significant enhancement of the influence growth hormone upon the growth-rate.

It can be concluded that the thymus is a significant factor in the growth effect of anterior pituitary growth hormone.

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J. COMSA

Department of Experimental Medicine,  
University of the Saar,  
Hamburg.  
July 11.

<sup>1</sup> Morel, J., and Gineste, P. J., *C.R. Soc. Biol.*, **130**, 459 (1939).

<sup>2</sup> Farris, E. J., and Griffith, J. A., "The Rat", edit. Lippincott (Philadelphia, 1949).

<sup>3</sup> Bezssonoff, N. A., and Comsa, J., *Ann. d'Endocrinol.* (in the press).

<sup>4</sup> Comsa, J., *Amer. J. Physiol.*, **166**, 550 (1951).

### Synapse Discharge by Single Fibre in Mammalian Visual System

FOLLOWING a single brief electrical shock applied to the optic nerve in the cat there is, from the lowest levels of stimulation, an approximately linear relation between the amplitudes of the pre- and post-synaptic responses recorded in the lateral geniculate body<sup>1</sup>. This was taken to indicate that only a small number of optic tract fibres are needed to discharge a geniculate cell.

In the course of recording extracellularly from single units in the visual pathways of the Dial-anæsthetized cat we have obtained further evidence in favour of this view. In the case of at least two geniculate cells that we have been able to study in some detail we conclude that they were each being discharged by a single optic nerve fibre. The evidence for this is illustrated in Figs. 1 and 2. Records *a* and *b* in Fig. 1 are representative of a large number obtained in the vicinity of a single geniculate cell in response to a stimulus of constant strength applied to the ipsilateral optic nerve; (*a*) consists of three and (*b*) of many superimposed oscillograph traces. It is clear that only three types of response are obtained: (1) a spike potential, (2) a synaptic potential (that is, an excitatory postsynaptic potential<sup>2</sup> recorded extracellularly) and (3) neither of these.

Our evidence that (2) is a synaptic potential is as follows: it always precedes the spike potential as

Table 1. INFLUENCE OF DAILY INJECTIONS OF ANTERIOR PITUITARY GROWTH HORMONE UPON THE GROWTH-RATE OF THE RAT

Hormone daily dose (Evans units)	Weight difference after 15 days of daily injections (arithmetical average of three animals)	
	A Hypophysectomized	B Thymectomized and hypophysectomized
0 (preperiod)	-12.8 ± 3.0	-12.0 ± 1.0
0.5	0	-4 ± 1.0
1.0	15.0 ± 3.8	6.5 ± 2.2
2.0	30.0 ± 5.1	11.5 ± 2.0
3.0	41.0 ± 7.2	12.0 ± 3.0
4.0	56.0 ± 5.0	17.0 ± 3.0