

Growth-Promoting Power for Planarian Worms of Eosinophilic and Basophilic Cell Groups in Anterior Pituitary.

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It has been demonstrated by Smith and Smith¹ that the injection of pituitary substances into hypophysectomized tadpoles produces 2 different effects according to the region of the anterior pituitary used. If the darker central core composed of basophil cells and chromophobes is injected the tadpoles grow more slowly and undergo metamorphosis more rapidly, while if one injects the surrounding lighter tissue, composed of eosinophil cells and chromophobes, the tadpoles grow unusually large. Although the separation of eosinophil and basophil cells in the pituitary is not complete, there is a sufficient predominance of the one in the outer portion and of the other in the central core to indicate that the growth stimulating principle arises from the eosinophil cells while that reacting with the endocrine system arises from the basophil cells.

Evans and Simpson² have also presented experimental evidence that 2 hormones are secreted by the anterior pituitary, one being a growth-promoting principle while the other reacts with the endocrine system. They consider their experiments to be concordant with the view that the one hormone is produced by eosinophil cells while the other is produced by basophil cells.

It seemed worth while to apply another test to determine whether the portion of the pituitary containing the greater number of eosinophil cells possesses a growth-promoting power exceeding that of the portion which contains the greater number of basophil cells. We used groups of planarian worms (*Planaria agilis*) newly regenerated from tails cut from our stock. Each group consisted of 30 worms, 6, 7, and 8 mm. long, and had a total length of 225 mm. The worms were fed twice a week over a period of 4 weeks when the total length of each group was again ascertained. The first group was fed liver from freshly killed rabbit, the second was fed strips from the outer, light-colored portion of anterior pituitary of freshly killed beef, while the third group received the reddish inner core of several beef, anterior pituitaries. All groups ate their food with great readiness.

At the conclusion of the experiment it was found that the worms

¹ Smith, P. E., and Smith, I. P., *Anat. Rec.*, 1923, **25**, 150.

² Evans, H. M., and Simpson, M. E., *J. Am. Med. Assn.*, 1928, **91**, 1337.

fed upon liver had increased in length 188 mm. or 83.5%, those fed upon the outer, acidophilic portion of anterior pituitary had increased 125 mm. or 55.5%, while those fed upon the inner, basophilic portion had increased in length 24 mm. or 10.6%. Thus the predominatingly acidophilic portion of the pituitary had manifested a growth-promoting power 44.9% greater than that of the predominatingly basophilic portion. Stating these results in terms of averages, they are as follows: At the beginning of the experiment both groups showed means of $7.50 \pm .07$ with standard deviation .548. At the conclusion of the experiment the group fed the basophilic portion showed a mean of $8.31 \pm .11$ and standard deviation .906, while the group fed the acidophilic portion showed a mean of $11.66 \pm .15$ and a standard deviation of 1.392.

It will be observed, however, that the growth-promoting power of liver exceeded the best pituitary growth by 28%. Whether there is inherently greater power in the liver or whether some factor of antagonism is at work in the pituitary tissue we have yet to determine. The work of Evans and Simpson² indicates an antagonism between the 2 hormones of the anterior pituitary, that promoting growth and that affecting the endocrine system.

Our investigation indicates that the predominatingly acidophilic portion of the anterior pituitary possesses a greater growth-promoting power for planarian worms than the predominatingly basophilic portion. This result was obtained by feeding the fresh gland to normal worms.

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Further Observations on Experimental Aortic Insufficiency.

III. Factors Accountable for the Systolic Collapse of the Central Pressure Pulse.

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The arterial pressure pulse during aortic insufficiency is described as having both a "water hammer" and "collapsing" characteristic, the former term referring to the impression given by the abrupt and great systolic rise, the latter, to the tactile and graphic effects of the steep gradient of its decline. Stewart¹ first directed attention to

¹ Stewart, H. A., *Arch. Int. Med.*, 1908, **1**, 102.