who in his earliest experiments on the larvae of tailless amphibians, obtained results comparable to those reported here, is working now, in his experiments on mammals and urodelan amphibians, with anterior lobe products which are polluted by posterior lobe substance. The latter circumstance seems to be of considerable importance as some of the effects in mammals, claimed by Smith to be caused by anterior lobe substance, may be really caused by admixture of posterior lobe.

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Anterior Lobe Substance, the Thyroid Stimulator. II. Effect of Feeding Anterior Lobe Upon Amphibian Metamorphosis.

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In 1921 one of us showed that feeding fresh anterior lobe of the hypophysis of cattle has no effect on the metamorphosis of *Urodelan* amphibian larvae.[1] As Smith[2] obtained precocious metamorphosis by feeding Armour's anterior lobe powder, he felt certain that this preparation is not pure anterior lobe powder, but owes its action to the presence of iodine or thyroid substance in it.

We fed anterior lobe powder to larvae of the Utah axolotl, raised from eggs in the laboratory and kept under identical conditions. A 1928 sample of Armour's commercial anterior lobe powder and anterior lobe powder prepared in our own laboratory by the method described in Article I of this series were used.

In one experiment 2 controls metamorphosed at an average body length of 58.2 mm., average age 141 days; 3 experimentals fed on our own anterior lobe preparation metamorphosed at an average body length of 63.7 mm., average age 140 days; and 2 experimentals fed on Armour's anterior lobe powder metamorphosed at an average age body length of 65 mm., average age 135 days; one of the latter 2 animals attained the largest size before metamorphosis (68.1 mm.) among the entire 1928 material. The feeding lasted for a period of approximately 102 days. Feeding of a 1928 sample of Armour's

* These experiments were carried out with the aid of the "Julius Friedenwald Research Fund" of the University of Maryland Medical School.

[1] Uhlenhuth, PROC. SOC. EXP. BIOL. AND MED., 1921, xviii, 11.

[2] Smith, P. E., *Brit. J. Exp. Biol.*, 1926, iii, 239.

thyroid powder, in the same kind of larvae, caused metamorphosis 14 days (at the latest) after the beginning of the experiment.

Neither our own nor Armour's preparation of anterior lobe had any effect on the metamorphosis of the salamander larvae when administered by mouth, while they proved most potent when injected intraperitoneally. Armour's preparation behaved in this respect entirely as our own preparation, and both differed from Armour's thyroid powders.

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Anterior Lobe Substance, the Thyroid Stimulator. III. Effect of Anterior Lobe Substance on Thyroid Gland.

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In previous work[1] we found that intraperitoneal injection of an extract made from Armour's anterior lobe powder causes the thyroid gland of the larvae of *Ambystoma tigrinum* to display its functional phase in a typical manner long before it is displayed in normal animals and linked with the progress of metamorphosis in the same way as it is in normal metamorphosis. Exactly the same result we obtained by injecting, intraperitoneally, an extract of anterior lobe powder prepared in our own laboratory by the method described in Article I of this series. Illustrations are required to demonstrate satisfactorily these results and will be published in a more complete article. The main results will be summarized here.

The animals used are the same as those discussed in Article I of this series. Larvae of the eastern as well as of the western race (Utah axolotle) of *Ambystoma tigrinum* were examined. The thyroids of 16 experimentals and 11 controls were examined. The thyroids were studied fresh, stained or unstained, by a method described fully in a previous article.[2] Three representative thyroids will be discussed here.

In one larva (CCXCIV b 2) the cells of the thyroid were found distinctly changed towards increased functional activity, although

* These experiments were made with the support of the Julius Friedenwald Fund for Research of the University of Maryland and of the Elizabeth Thompson Science Fund of Harvard University.

[1] Uhlenhuth, E., and Schwartzbach, S., *Anat. Rec.*, 1926, xxxiv, 119. *Brit. J. Exp. Biol.*, 1927, v, 1.

[2] Uhlenhuth, E., *Roux's Arch. f. Entwicklungsmech.*, 1928, in press.