

5736

Ovulation in the Neotenic *Amblystoma Tigrinum* Following Administration of Extract of Mammalian Anterior Hypophysis.

ADRIAN BUYSE AND R. K. BURNS, JR.

From the Anatomical Laboratory, University of Rochester School of Medicine and Dentistry.

Ovulation in adult amphibians has been experimentally induced by hypophyseal transplants or by administration of extracts of the hypophysis in a number of species by various workers. Wolf¹ succeeded in producing ovulation out of season in frogs by means of homoplastic transplantation of anterior hypophysis. Houssay, Giusti, and Lascano-Gonzalez² and Houssay and Giusti³ were able to bring about a similar response in toads by the use of homoplastic implantations of anterior lobe. The results obtained by Noble and Richards⁴ on the salamander *Eurycea bislineata*, in which ovulation has been induced by means of homoplastic transplants, are confirmed by the findings of Adams^{5, 6} who was able to obtain egg-laying in adult *Triturus viridescens* and *Triton cristatus* by the same means. Similar results were observed by Adams^{7, 8} if heteroplastic transplants from anurans were substituted for the homoplastic implants. Adams⁹ was also able to confirm the earlier findings of Houssay *et al* on ovulation in toads, in being able to elicit the response only with homoplastic transplants of anterior lobe substance.

Ovulation has likewise been produced in anuran amphibians with extracts of the mammalian hypophysis. Through the administration of an alkaline aqueous extract of the anterior lobe of cattle, Kehl¹⁰ induced ovulation in the mature frog, *Discoglossus pictus*, and Adams⁹ using a similar extract obtained the same response in frogs. Up to the present time there appears to be no record of

¹ Wolf, O. P., PROC. SOC. EXP. BIOL. AND MED., 1929, **26**, 692.

² Houssay, B. A., Giusti, L., Lascano-Gonzalez, J. M., *Rev. Soc. Argent. Biol.*, 1929, **5**, 397.

³ Houssay, B. A., and Giusti, L., *Compt. Rend. Soc. Biol.*, 1930, **104**, 1030.

⁴ Noble, G. K., and Richards, L. B., *Am. Mus. Novitates*, No. 396. 1930.

⁵ Adams, A. E., PROC. SOC. EXP. BIOL. AND MED., 1930, **27**, 433.

⁶ Adams, A. E., *Anat. Rec.*, 1930, **45**, 250.

⁷ Adams, A. E., *Anat. Rec.*, 1931, **48**, 37.

⁸ Adams, A. E., *Anat. Rec.*, 1931, **48**, 38.

⁹ Adams, A. E., PROC. SOC. EXP. BIOL. AND MED., 1931, **28**, 677.

¹⁰ Kehl, R., *Compt. Rend. Soc. Biol.*, 1930, **103**, 744.

ovulation in urodele amphibians produced by means of extracts of mammalian hypophysis.

Experiments on the induction of ovulation were carried on during the month of June with 2 adult female Axolotls (usually considered a neotenic form of *Amblystoma tigrinum*) known not to have ovulated previously in the laboratory. These animals were given daily 1 cc. of extract of whole sheep's pituitary gland* injected into the peritoneal cavity. This extract had already proved active in producing accelerated growth and premature activity in the immature gonads of larval salamanders.¹¹

At the end of the second day one animal gave a positive response to the treatment by spawning several dozen eggs. The second animal did not respond until the third day when 40 to 50 eggs were laid. A few hours after administering the third cc. of the extract to the first animal a copious spawning occurred, approximately 500 ova being liberated. The response of the second animal could not be increased by further administration of the extract, so the experiment was discontinued for the time.

On the arrival of a new shipment of extract prepared in March, and of proved potency in stimulating the gonads of immature female rats and dogs, it was decided to repeat the experiment on the second animal. Thirteen days having elapsed since the previous injection, 1 cc. of the new extract was given intraperitoneally consecutively for 4 days. On the fourth day approximately 2 dozen ova were extruded. In addition to the extrusion of ova, numerous small masses of caseous debris, imbedded in strings of gelatinous material, were also found with the spawned ova in the container. The debris was found to be clumps of resorbing ova which were doubtless ovulated during the previous administration of the extract, but not extruded from the abdominal cavity.

* Alkaline aqueous extract of whole sheep's pituitary as prepared by Parke Davis & Co., and kindly supplied to us through the courtesy of Dr. E. P. Bugbee. For details of preparation refer to Bugbee, Simond and Grimes, *Endocrinology*, 1931, 15, 41.

¹¹ Burns, R. K., Jr., and Buyse, Adrian, *Anat. Rec.*, 1931, 48, 12.