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Ovogenesis in the Mammalia.

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Ovogenesis occurs throughout adult life in the guinea pig, cat, dog, and man, as a rhythmical process, during which thousands of ova are produced *de novo*, followed by the degeneration of all but a few which mature. In the guinea pig, cat and dog this rhythm of ovogenesis coincides with the rhythm of the oestrus cycle, beginning at ovulation and reaching its peak at anoestrus, with wholesale degeneration occurring at late prooestrus. Lack of knowledge of a definite oestrus cycle in man weakens the correlation here, but the rhythm of ovogenesis is as striking in the number of ova produced and destroyed as in the other animals.

New sex cells are produced by proliferations from the germinal epithelium in the form of invaginations and ingrowths of epithelial cords. These become separated from the germinal epithelium, pass through the tunica albuginea and form a more or less continuous layer underneath the tunica. From one to many cells in each group may develop into ova, the remainder forming the follicle cells.

Contrary to the concept involved in the germ plasm theory, the mammalian ova (excepting those that mature and are fertilized) have a shorter life span than any other group of cells in the body outside of the reproductive tract.

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The Functional Difference Between the Pars Intermedia and Pars Nervosa of Hypophysis of Frog.

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Some years ago the writer demonstrated¹ that implantation of the combined *pars intermedia* and *pars nervosa* of adult frogs into tadpoles causes heavy pigmentation and transitory contraction of the body walls lasting several days. In a later paper² it was shown

¹ Allen, B. M., *Science*, 1920, N. S. Vol. lii, 274.

² Allen, B. M., *Anatom. Rec.*, 1925, xxxi, 302.

by transplantation of each part separated from the other, that the *pars intermedia* is alone involved in inducing pigmentation. The contraction of the body walls is conspicuous enough but difficult to measure. The object of the present paper is to present the results of such an evaluation. This was accomplished by measuring the area of the shadow cast by vertical illumination of each tadpole upon photographic print paper. Each print was projected upon paper by an opaque projection lantern and magnified 5 diameters. The area of each image was then measured with a planimeter, several such measurements of each tadpole used in the experiment being made at different times.

Transplants of *pars anterior*, *pars intermedia*, and *pars nervosa* were placed in a pocket under the skin over the right eye of *Rana aurora* tadpoles. This makes possible the location and later examination of the transplant in each case. The methods followed, though very laborious, do not give a quantitative measure of results but they do give a decision as to the effects of these implants upon body contour. It is felt that such painstaking studies upon a few specimens are more valuable than less careful studies of many. This method is considered preferable to volumetric methods because of the difficulty of separating water from the tadpoles without injury to them. Anaesthetization with ether in water may have slightly retarded growth during the period of the experiment, but the methods were impartially applied and it is felt that they serve as a fair index of the situation. The numbers of specimens of each type used were as follows: controls 6; *pars anterior* 9; *pars intermedia* 9; *pars nervosa* 9. Readings were made just before making the implant and at intervals of 2 days for 8 to 10 days later. Owing to some lack of uniformity in making later recordings, we shall take into account only the first 3 readings. In each case the rays were applied vertically in the dorso ventral plane of the tadpole. The results are shown in the following tabulation.

Effects of homoplastic transplantation of different portions of the hypophysis of adult *Rana aurora* frogs into tadpoles. Figures indicate average area of shadow.

Nature of transplant	Area on day of operation	Area after 2 days	Area after 4 days	% change after 2 days
Normal	.667 sq. c.	.664 sq. c.	.651 sq. c.	-0.45
<i>Pars anterior</i>	.702 sq. c.	.746 sq. c.	.766 sq. c.	+6.26
<i>Pars intermedia</i>	.784 sq. c.	.747 sq. c.	.748 sq. c.	-4.71
<i>Pars nervosa</i>	.765 sq. c.	.653 sq. c.	.675 sq. c.	-14.64

The slight contraction caused by *pars intermedia* transplantation and a slight temporary darkening of the surface of the tadpoles into which the *pars nervosa* is transplanted may be due to the presence of secretion which has been interchanged between these two intimately associated structures by diffusion. In the case of the *pars intermedia* transplants pigmentation becomes progressively deeper until at the end of 3 or 4 weeks it is extremely intense. Transplantation of the *pars nervosa* never gives more than a slight temporary deepening of color that disappears completely in 2 or 3 days.

We believe that the above data strongly point to a specific influence exerted by the *pars nervosa* upon the distension of the body wall.

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Do Foreign Proteins Multiply in the Animal Body?

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If 2 cc. horse serum per kilo of body weight are injected subcutaneously, in minute divided doses, into a normal dog, and, if the absorption of the injected horse proteins into the canine circulation is followed by quantitative tests with rabbit precipitin, data are obtained that suggest a 100% absorption of the injected horse proteins into the blood stream by the end of 4 to 7 days, rising to a 200%, or even a 400% absorption by the 14th to 21st day. A 200% horse protein assay of the blood alone might well mean a 1000% or even 2000% alien protein content of the body as a whole.

This does not necessarily mean that the injected horse proteins multiply as a living virus in canine tissues, a biochemical metaphor thus far suggested solely for the bacteriophage. Among the conceivable alternate explanations are: (a) apparent multiplications due to hydrolysis or colloidal dispersion of the injected horse proteins, (b) the formation of pseudo-horse proteins as a result of denaturation of the body proteins of the injected dog, (c) the synthesis or liberation of antibodies of approximate horse protein specificity, and (d) toxic increases in some hypothetical non-specific precipitin reaction.

This paper represents selected data from over 50 experimental and control dogs.