

We hope to report elsewhere these findings and those of similar studies with the young pig and chick now in progress.

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¹ Dollar, A. M., Porter, J. W. G., Roy, J. H. B., and Shillam, K. G. (unpublished results).

² Somogyi, M., *J. Biol. Chem.*, **160**, 69 (1945).

³ Larsen, H. J., Stoddard, C. E., Jacobson, N. L., and Allen, R. S., *J. Anim. Sci.*, **15**, 473 (1956).

⁴ Shaw, R. H., Woodward, T. E., and Norton, R. P., *J. Agric. Res.*, **12**, 575 (1918).

Artificial Activation of the Egg in a Gynogenetic Spider Beetle

IN a recent communication in *Nature* by Moore, Woodroffe and Sanderson¹, it was shown that the spider beetle *Ptinus latro* Fab. exists only as females and that these require to be inseminated by males of the allied *Ptinus hirtellus* Sturm in order to produce viable eggs. Insemination by sterilized males was ineffective. The details of the cytological phenomena involved were communicated at the Tenth International Congress of Entomology, 1956². Since no conclusions could be reached as to whether the sperm enters the yolk of the *P. latro* egg, it is proposed to carry out experiments using labelled sperm and autoradiography. Meanwhile, the following is a report on results of experiments on artificial activation of the virgin egg. The methods employed involved cold and heat treatments, exposure to ether vapour, and puncturing with a fine glass needle, but the best results were obtained with the needle puncture method or traumatization. It was found that the maturation division proceeded as far as telophase (Fig. 1) in 50–60 per cent of the 200 eggs treated. Eggs were squashed in aceto-orcein from 10 to 120 min. after puncture and it was observed that the maturation division is complete usually after 30 min. However, no onset of cleavage was seen up to 2 hr., after which time the eggs tend to dry up. In untreated

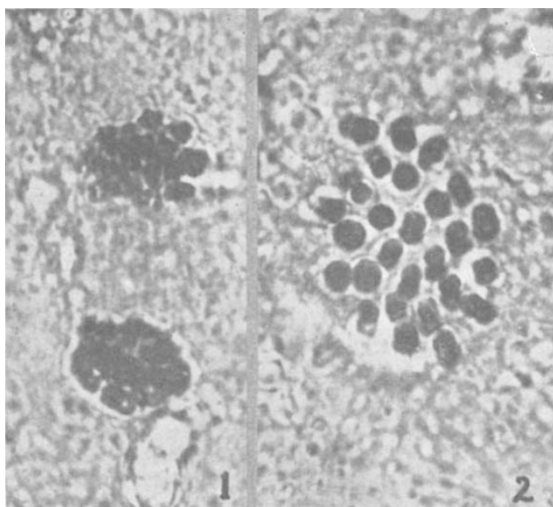


Fig. 1. Telophase of maturation division in an activated egg
Fig. 2. Arrested metaphase in an 'unfertilized' egg

eggs from virgin females, the development is usually blocked at the first metaphase (Fig. 2). The chromosomes may remain in this stage up to a period of five days, and then degenerate. From the remarkably high percentage of eggs activated by traumatization, it seems reasonable to assume that the role of the sperm in initiating activation is mainly of a physical nature. Further work is in progress and will be reported elsewhere.

The low percentage of viable eggs produced by mated *P. latro* calls for some comment. The fact that large numbers of sperms can be seen adhering to the chorion of eggs from inseminated females suggests an inability on the part of the female to regulate the flow of sperms, with consequent rapid depletion of the supply and non-activation of the later-laid eggs. The presence of the spermatheca and the necessity for activation by sperms suggest that parthenogenesis in this beetle is of recent origin.

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¹ Moore, B. P., Woodroffe, G. E., and Sanderson, Ann R., *Nature*, **177**, 847 (1956).

² Sanderson, Ann R., *Proc. Tenth Int. Cong. Ent.* (1956) (in the press).

The Diapause Hormone of the Silkworm, *Bombyx mori*

IN 1924, Watanabe¹ postulated that silkworm eggs overwinter as a result of receiving an 'inhibitory' substance from the mother moths, but the existence of the substance has not hitherto been substantiated experimentally. On the other hand, I have found² that the suboesophageal ganglion of the silkworm is responsible for the hibernation of silkworm eggs; but the organ that furnishes the active principle was not known. Evidently diapause of the silkworm is controlled by a hormone, similarly to the moulting or metamorphosis of insects. I attributed³ the diapause of silkworm eggs solely to the function of the suboesophageal ganglion, the brain having no effect, whereas Fukuda⁴ ascribed the activity of the suboesophageal ganglion to brain regulation by way of the oesophageal connectives. Thus in both hypotheses the suboesophageal ganglion is regarded as the actual source of the principle leading to the production of diapause eggs. It was not known whether the substance secreted from the suboesophageal ganglion—the diapause hormone—is identical with the inhibitory substance suggested by Watanabe or not.

Many attempts have been made to extract diapause hormone from blood or ovaries of pupæ with various organic solvents. The ganglion begins to release the diapause hormone into the blood immediately after pupation⁵, and the ovaries of silkworm pupæ grow most rapidly at the middle pupal stage⁵. Furthermore, it was considered that the suboesophageal ganglion