

Experiments Concerning the Cleavage Stimulus in Sand Dollar Eggs

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When the form of a sand dollar egg is modified to that of a torus before the cleavage furrow is determined, it divides only in the region of the spindle. The torus is thus converted into a binucleate, horseshoe-shaped cell. The furrow is temporally and morphologically normal. In this experiment, a large portion of the cell was at a considerable distance from the asters but did not exhibit any signs of furrowing. This observation cannot be reconciled with any hypothesis in which the position of the furrow is established by the absence of stimulus.

The second division of the torus-shaped cell occurred in concert with the controls and resulted in isolation of two uninucleate cells from the free ends of the horseshoe. The bend of the horseshoe was binucleate but within five minutes of the completion of the two normal divisions, a furrow appeared between the polar regions of the two asters in the binucleate cell. A furrow was thus completed in a region that was never in close proximity to a spindle or chromosomes. The non spindle division could be delayed until the third or fourth cleavage. It appeared normal; it was completed in normal time and in concert with the other cells of the embryo. Since normal division has thus been demonstrated to occur in the absence of the spindle and its contents, it is proposed that neither of these entities play any necessary role in cytokinesis of sand dollar eggs.

Following frequent kneading, accomplished by compression and release and by extrusion, temporally and morphologically normal division occurs. The mechanism whereby the stimulus is delivered is therefore either very resilient or very rapid.

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Effect of Carbonic Anhydrase Inhibition on Urine of a Marine Teleost, *Pseudopleuronectes Americanus*

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Heinemann and Hodler (Bull. Mount Desert Island Biol. Lab. IV, part 1. p. 42, 1953) found that in general marine teleosts, like marine elasmobranchs, could not alkalize their urine following the administration of acetazolamide (6063). Their data, however, indicated that in the special case of the flounder, *P. Americanus*, acetazolamide caused a rise in urine pH, Na⁺ and K⁺. Since we have found carbonic anhydrase in the kidney