

## A NOTE ON THE ESTABLISHMENT OF CLEAVAGE FURROWS BY MITOTIC SPINDLES

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This investigation was designed to determine whether the mitotic spindle of the sand dollar *Echinarachnius parma* egg can establish a cleavage furrow mechanism at the egg surface. Previous investigations showed that in cleaving echinoderm eggs only a pair of asters is required and that absence of one or both asters prevents furrowing. On the other hand in animal tissue cells the asters are much reduced and the volume of the mitotic apparatus is proportionately greater. No geometrical analysis of the role of different components of the mitotic apparatus of tissue cells in furrow establishment has been accomplished. Since spindles and asters appear to be composed of similar structures having similar chemical constitution, it appeared possible that both might be able to establish furrows given the proper geometric circumstances.

By micromanipulation techniques involving perforation, cutting, and artificial constriction, portions of the egg surface were moved close to or in contact with the equatorial spindle surface about 20 minutes before the position of the spindle is determined. The geometrical relations were such that the linear elements of the asters could not have been affecting the experimental surface region. In all cases furrows formed in surfaces adjacent to the asters and their time of appearance usually anticipated those located in the surface at the normal distance from the mitotic apparatus.

The spindle of cleaving eggs appears to be capable of furrow establishment even though its geometrical relation to the surface may prevent its participation in the normal process. In tissue cells on the other hand where the spindle is relatively large and close to the surface and the asters are small, the spindle may be primarily responsible for furrow establishment.

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WATER AND IONIC MOVEMENTS ACROSS THE ISOLATED URINARY BLADDER OF THE WINTER FLOUNDER *Pseudopleuronectes americanus*

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The urinary bladder of the teleost fish *Lophius americanus* was shown by Murdaugh, et al. (J. Clin. Invest. 42:959, 1963), to have the ability to alter the composition of the urine in as much as inulin and bicarbonate ions appeared to move through the bladder wall. Lahlou (Comp. Biochem. Physiol. 20:925-938, 1967) reported that the ureteral urine of the flounder *Platichthys flesus* was distinctly different from urine retained for a time inside the bladder. He stated that the bladder completed the work of the kidney by continuing to reabsorb  $\text{Na}^+$  and  $\text{Cl}^-$  as a hyperosmotic solution resulting in dilution of the bladder urine. Lahlou and Fossat (C.R. Acad. Sc. Paris 273:2108-2110, 1971) found that an *in vitro* preparation of the freshwater trout bladder *Salmo irideus* reabsorbed a hyperosmotic sodium chloride solution, producing dilution of the mucosal fluid. Johnson,