long neck. The latter may be due to cell locomotion.

Before final separation, part of the blastomeric cytoplasm may become constricted delimiting and apical sphere. The sphere is usually resorbed by the blastoderm cell and its significance is unknown.

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Cleavage of Echinorachnius Eggs Under Constant Physical Load

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In order to learn more of the physical forces which accomplish cytokinesis, glass weights were attached to fertilized eggs and the subsequent first division studied. Eggs were physically divested of jelly and vitelline membrane and made adhesive by immersion in sea water acidulated to pH 3.7 - 4.0 with 0.1 M HCl. They were then pipetted onto the upper, horizontal surface of a submerged glass platform mounted on trunions. Glass beads approximately 150 micra in diameter (Minnesota Mining and Manufacturing Co.) were sprinkled over the cells and the chamber then flushed with ten volumes of calcium free sea water (pH approximately 8) to which sodium citrate had been added. When the table was inverted, the cells supported the weight of the glass beads. Observations and photographs were made through a horizontal miscroscope.

When cells were loaded about 30 minutes before the time of division, they were stretched to four to six times their normal diameter and the cleavage plane was at right angles to the direction of stress. No difference in cleavage time of loaded and unloaded cells was apparent. When loading was delayed until some cells showed signs of furrowing, the cleavage plane appeared at any angle to the direction of stress including parallel. Only cells which began cleavage under the load were studied. Division of loaded cells was not necessarily accompanied by elongation. When the cell surface was marked with carbon particles, it could be seen that cleavage could occur in the absence of the shifting of the surface toward the furrow which occurs in the unloaded cell. Further, marks situated at the base of the beginning furrow remained there as it deepened.

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