

a 40 hour period after fertilization increases to 3,000 cells, with a proportional increase in DNA; this is associated with differentiation to the pluteus form.

Various agents added to the embryonic environment have caused specific modification in development. The effects, which vary with the drug, include 1) block in cleavage; e.g. actidione is extremely active, 2) general toxicity to the embryo occurring at various stages of development and directly correlated with drug concentration, e.g. nitrogen mustard, actinomycins, and 3) developmental block at specific stages in development, irrespective of drug concentration, e.g. antimetabolites - 6-mercaptopurine, 8-azaguanine, diazo-oxo-norleucine, fluorinated and brominated pyrimidines. Some are effective at 10^{-9} M/L. The action of the antimetabolites is prevented by the addition of specific metabolites.

This system appears to be useful in screening substances for specific growth inhibiting effects, in obtaining clues to their mechanism of action, in determining the effects of drugs on DNA synthesis and function in embryonic development, and in applying tritium labelled tracers to localize drugs.

Growth Patterns in Ceramiaceae

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A study of photomicrography and acetocarmine staining of the growth patterns in *Plumaria elegans* and *Antithamnion floccosum* showed that the formation of apical cells resulted from equal divisions. Alternation of oblique apical crosswalls, as in *Callithamnion*, was not observed. Apical parts may be dissociated by treatment with pectinase, trypsin or versene.

The mentioned *Plumularia* and *Antithamnion* species are not previously described from the area, and were found in Anemone Cave tidepools. *Corallina officinalis*, vs. *profunda* and *spatulifera*, were both found in many tidepools on the mainland shore inside the Thrumcap.

Sea Urchin Sperm Metabolism

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The oxidative metabolism of *Echinarachinius parma* sperms was further studied utilizing a recording, open oxygen-electrode technique with a polyethylene-enclosed diffusion electrode. This method is rapid and reproducible.

The sperms readily utilize glucose, succinate, β -hydroxybutyrate and α -glycerophosphate; less readily glycerol and lactate. The induced respira-

tion usually amounts to an additional 50% of the original maximal endogenous rate; but the most striking effect is the prolongation of respiratory activity. --- The endogenous respiration is always considerable, but diminishes rapidly with time. This is in contrast to manometric measurements, reported by earlier investigators, which indicate a prolonged utilization of endogenous material. --- The endogenous respiration is completely inhibitable by cyanide, azide, hydroxylamine and iodoacetamide. Malonate, arsenite and fluoride cause partial inhibition. Observations on the cytochrome α -bands (a_3 , a , b and c present) show normal reaction pattern.

The study indicates the presence of a completely normal cytochrome system, as well as the functioning of the tricarboxylic acid system and the normal glycolytic pathway.

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Regeneration of the Dorsal and Caudal Fins Following Ablation of the Spinal Cord in Adult (*Fundulus Heteroclitus*)¹

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The author reported recently that larval and adult urodele limbs could be surgically isolated from the central and autonomic nervous systems and still retain their regenerative capacities (Liversage, '58, '60a, '60b). In view of the above, consideration was given to the possibility that intact central nervous pathways were not essential for the regeneration of fins in adult killifish. A total of 92 animals were used.

Dorsal and caudal fins were neurally isolated from the rest of the organism by spinal cord ablations leaving, however, a nerve source intact at the local level of sufficient quantity to support regeneration. The sites of the ablations were (1) immediately posterior to the dorsal fin and (2) immediately anterior and posterior to the dorsal fin; thus, isolating the caudal and dorsal fins, respectively, from the rest of the organism. Following a recuperation period of at least 7 days the neurally isolated fins were amputated without anesthetizing the animals. The amputated structures were maintained in an isolated condition throughout the experiment except for vascular and skin connections.

It was found that amputated fins regenerate in absence of all central connections with the brain stem; therefore, stimulation of the animal (especially the pituitary-adrenal (interrenal bodies) mechanism) by way of the spinal cord could not have taken place.

The probability is that the function of nerves in fish fin regeneration, as in urodele limb regeneration, is solely at the local level presumably contributing to the "chemical bath" in the regenerating area.

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