Investigation of the transfer of Cl^-, Br^- and I^- across the isolated gastric mucosa of *Squalus acanthias* (see Science 129: 1224, 1959) revealed that these monovalent anions are actively transported from serosa to mucosa between identical solutions and in the absence of a significant transepithelial potential. The relative rates of transfer are very similar to those previously observed for *Rana catesbiana* though there is less discrimination between Cl^- and I^- in the case of Squalus. Unlike the case for *R. Catesbiana,* the mucosa to serosa flux of Cl^- was not substantially greater than the D. C. conductance (previously determined). Confirming an earlier suspicion, it was definitely determined that it is necessary with this isolated tissue to work at a lower ambient temperature (15° C).

The flux of urea across the isolated uterine epithelium of *Squalus* was determined in collaboration with Dr. Bodil Schmidt-Nielsen. There was no evidence of active transport. The permeability to urea was so low (1.10^{-6} cm. sec. $^{-1}$) that the low urea concentration of dogfish uterine fluid could be explained on this basis.

Further attempts to obtain a viable preparation of the pollack gas gland epithelium were unsuccessful.

The Metabolism of Aminobenzoic Acid Isomers in Marine Fishes

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The conjugation and excretion of three aminobenzoic acid isomers (p, m and o) were studied in three types of marine fishes (Dogfish, flounder and goosefish). The *in vivo* studies showed that all these 3 types of fishes can conjugate the aminobenzoic acid into acetyl, glycyl and glucuronyl products. In dogfish the glucuronides of the 3 isomers were excreted in greater amounts than the glycinates; while in flounder the glucuronide of the meta isomer excreted was less than that of the glycinate. The *in vitro* studies with kidney slices technique have shown that both dogfish's and goosefish's kidney can form acetyl and glycyl products from the three aminobenzoic acid isomers; while the flounder kidney synthetized the glycyl product, but not the acetyl form.

Effects of Agents Used in Cancer Chemotherapy on the Echinoderm Embryo

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Chemicals inhibiting tumor growth usually modify the growth of certain normal tissues. Chemicals of interest in cancer chemotherapy were studied on the sand-dollar embryo (Echinarachnius parma). Each egg, in

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, trypsine 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-