

daily with intraperitoneal injections of selected antimetabolites and challenged with homografts of pigmented scales (which normally undergo melanocyte disintegration on the third postoperative day at 28° C as a result of the hosts' immunological responses). When administered near lethal doses of colchicine (0.005 mg/fish/day) or podophyllin (0.001-0.01 mg), drugs which inhibit mitosis by arresting the anaphase movements of chromosomes, host fishes nevertheless exhibited an immunological response by destroying their homografts as soon as did the controls. Thus, in the absence of overt cytokinesis, antibody formation can proceed normally.

Other compounds, unlike the foregoing, which interfere with the synthesis of nucleic acids and/or proteins, were effective inhibitors of antibody production as evidenced by delayed homograft reactions. Methyl bis-(beta-chloroethyl)-amine (Mustargen) (0.1 mg), triethylene melamine (TEM) (0.01 mg) and N, N', N'' - triethylenethiophosphoramidate (THIO-TEPA) (0.1 mg) doubled the survival time of homografts, while the folic acid antagonists, aminopterin and A-methopterin (Methotrexate), produced even more striking results when administered in doses of 0.1 mg in suspension.

Clearly, an immunological response is impossible without the synthesis of nucleic acids and proteins. Mitotic proliferation, however, is not essential to antibody formation, though it may be an inevitable consequence of antigenic stimulation especially if DNA replication is an indispensable step in communicating the specificity of the antigen to the antibody.

The Elasmobranch Thyroid-pituitary System

William C. Grant, Jr. and Allyn J. Waterman
Williams College

Thyroid of the skate, *Raja erinacea* and *R. diaphanes*, is a brownish, compact gland located ventral to the bifurcation of conus arteriosus and carotid arteries, weighing approximately 63-112 mg. in animals with weights between 885 and 1170 gm. When its function was studied with radioactive iodide, the 24-hour uptake average (2 animals) was 0.26 percent of the injected dose and thyroid/blood ratio 94, 48-hour uptake average (2 animals) was 0.52 percent and thyroid/blood ratio 219, and 72-hour uptake average (2 animals) was 0.16 percent and thyroid/blood ratio 1.6. Peak of radioactive iodide-uptake must lie around 48 hours or earlier.

Skates survive thyroidectomy well, although the skin heals with difficulty or not at all. The operation is not difficult. Immersion in 0.1 percent solution of MS222 provokes anaesthesia in one or more minutes. Since the animals go under rather quickly, they must be watched and then removed as soon as bodily activity mostly ceases. Thyroidectomy is performed with the animal out of water, and with no special effort necessary to insure a supply of sea water to the gills although some may be squirted

over the gills from time to time during the 5-10 minutes required for the operation.

Dogfish pituitaries were separated into their four component parts: rostral, central, neurointermedial and ventral lobes, and frozen for bioassay. These will be bioassayed with the hypophysectomized red eft (red-colored land stage of the newt, *Diemictylus viridescens*) and weaver finch (Witschi) techniques for prolactin and luteinizing hormones respectively. A few preliminary tests with the hypophysectomized red eft encouraged the expectation that prolactin is present in the rostral lobe, but no trace of it has so far been found in the other lobes.

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Ecology and Behavior of the Hermit Crab, *Pagurus acadianus*

William C. Grant, Jr.

Williams College

A field survey was conducted on *Pagurus acadianus* in an area roughly 300 meters square along the west shore of the laboratory cove at intervals from July 10 to August 25. During this period 191 animals were captured, marked and released. The mean number of crabs occupying the area on any one day was estimated at 14 individuals. During the period of the study only 10 recaptures of marked animals were recorded, and this data plus a study of the dispersal rate of the crabs indicates that the population was a highly mobile one lacking territorial patterns of behavior. Over 60% of the population inhabited the shells of *Buccinum undatum* while the remainder, consisting mostly of small individuals, were found in the shells of *Thais lapillus*.

Behavioral studies indicate that *P. acadianus* has a strong preference for its home shell. Crabs removed from their shells and given a choice situation involving the original shell and other shells varying according to size, color and species were able to select their home shells for re-entrance in 91% of the trials within the limits set by the particular testing procedure. The identification of the home shell is not visual. Shell selection in nature probably depends on the size of the crab and a shell weight/shell volume index. Automatic operations recording of crab activity in the laboratory failed to show any definite pattern involving circadian rhythms. All data obtained from the above studies are currently being subjected to statistical analysis.

Studies on the Endocrinology of the Skate Pituitary

William C. Grant, Jr.

Williams College

The present studies were directed towards extending the limited information available relative to the functional characteristics of the