(Echinarachnius parma) might be used as an indicator of viral activity. The method described by Karnofsky and Basch (J. Biophys. and Biochem. Cytol. 7:61, 1960) had to be modified because viral and control materials alike were inhibitory upon prolonged contact. These non-specific effects could be eliminated by repeated washing of embryos at different developmental stages. Refinement of the washing procedure will be necessary before further work on possible specific effects can be done.

III. Preliminary experiments on *in vitro* cultivation of trypsindispersed dogfish embryo cells gave encouraging results.

The Pulse Wave In Squalus Acanthus

Warner F. Sheldon, Wendy Sheldon, and Lura Sheldon University of Pennsylvania, Oberlin College and St. Lawrence University

It has long been known that the pulse generated by the ventricle and bulbus arteriosus of the dogfish passes through the gills and appears in the dorsal aorta. This does not seem compatible with our knowledge of the damping effect of a capillary bed. How can a pulse pass the gills? Is there something unusual about the capillary network of the gill or is this phenomenon to be explained in some other way? Our studies have involved (1) pressure records from the ventral and dorsal aorta, (2) histologic study of normal and injected gills, and (3) direct observations of gill capillaries in the living dogfish.

Pressure records with a Lilly capacitance manometer confirm previous observations. In passing through the gill circulation, the pulse wave is reduced, usually being about 2/3 or 1/2 of its original size. In the dorsal aorta, the surviving pulse is modulated by small undulations, 4-5 times the pulse rate, synchronous with the respiratory movements of the gills. Histologic studies of the gills disclose that the capillary network of the lamellae appears to have a relatively large lumen, probably in order to accommodate the nucleated red blood cells of the dogfish which are considerably larger than the non-nucleated cells of mammals. A structure of special interest is the large arterial "sinus" which extends the length of each filament at its base. The lumen of this "sinus" is highly tortuous bebecause it is encroached upon or traversed by many trabeculae which look like smooth muscle cells with an endothelial covering. Blood from the afferent gill arteries enters this sinus through defects in the medial coat and thence is distributed to the capillaries of each lamella This tortuous swamplike sinus, lying as it does between the artery and the gill capillaries, would seem to be ideally suited to damp out any pulse wave.

Direct observation of the gill circulation during life has been possible on several occasions. No convincing pulse wave was observed but the respiratory movements, always more rapid than the pulse rate, make observations difficult. Injection studies with India ink disclose no shunts between afferent and efferent gill arteries.