

In this animal the heart is large enough to be divided into halves, and when mounted in saline in separate chambers under identical conditions, the two halves will beat synchronously. Graphic records, taken from preparations thus arranged, showed that the 50 mgm. dose of nembutal stopped the heart in 2 minutes; whereas veronal had little or no effect after several hours.

The above order of the depressant activity of the barbiturates closely parallels their toxicity, as found by the author, for intact animals (rats). This suggests that the central actions of the barbiturates may not alone be of fundamental importance in the treatment of overdosage from the barbiturates and that veronal is probably best suited for use as a cerebral sedative in certain clinical heart conditions.

MORPHOLOGY OF THE PECTORAL ARCHITECTURE IN FISH

A. BRAZIER HOWELL, *Johns Hopkins University*

In spite of the fact that the question of the morphology of the appendages has received the critical attention of investigators for a great number of years, much remains to be done in this subject. In connection with work on the higher vertebrates it became necessary for me to investigate the situation in fish, with greater attention paid to the nerve-muscle-skeleton interrelationship than has heretofore been accorded.

During the summer of 1932 I took the opportunity to establish neurologically the segmental relationship of the muscles of the paired appendages in a number of fish. Besides precise dissections of fresh specimens of several forms of fish, the dogfish (*Squalus*), cod (*Gadus*), and pollack (*Gadus*) were anaesthetized with chlorotone, and after the nerves of the fins were exposed, these were subjected to a properly controlled faradic current. There was considerable variation in the response of the different muscle divisions, although such variation followed a fairly uniform pattern. This method of approach, of course, removes any chance for error in the proper interpretation of muscle derivation.

Nerve stimulation amplifies as well as verifies the knowledge gained from precise dissections, and indicates that there is pronounced dissimilarity in the secondarily basic pattern of the fin muscles. In other words the fin muscles, although relatively simple in plan, are of characteristically dissimilar arrangement in some of the major groups of fishes, indicating that these groups are derived from different sorts of the most primitive finned vertebrates. Furthermore it is indicated without reasonable doubt that the primary muscle divisions were divided not into extensor (elevator) and flexor (depressor) groups of appendageous muscles, but were based on a protractor and a retractor series of myomeric divisions.