

XVIII. NEUROPHYSIOLOGY*

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RESEARCH OBJECTIVES

The neurophysiology laboratory is mainly concerned with synaptic transmission; that is, the way neural relays operate. One of its major findings in the past two years is that an impulse does not necessarily invade all the terminal processes of an axon. The probability of impulse passage at certain axon bifurcations is significantly lower than unity, and is easily altered by activity in neighboring fibers. Such interaction occurring before the synapse (the relay point) may account for some of the lability of spinal reflexes – their facilitation and inhibition. At present, we are engaged both in explaining this decremental conduction on the basis of the geometry at a bifurcation and demonstrating its occurrence in known reflex arcs.

A second project is concerned with coding in the relatively simple visual center of a frog. The frog does respond to the size, direction, and velocity of objects in its visual field and has only the retina and the three-layered superior colliculus as analyzers. We are attempting a statistical analysis of many single-unit records during a visual stimulus patterned in time and space. Thereby we propose to find what transformations occur in the optic system of the frog.

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