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Electron microscopical examination of the junction between the myenteric plexus and the longitudinal muscle of the guinea-pig ileum

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Electron microscopical examination of the longitudinal muscle of the guinea-pig ileum confirms previous observations (Paton & Zar, 1968) that this layer is usually devoid of nerve fibres. The problem arises as to how excitatory and inhibitory stimuli can reach the longitudinal muscle cells.

Anatomical evidence shows five different possibilities:

(a) Nerve fibres right at the surface of ganglia in the myenteric plexus show “synaptic” vesicles, frequently forming aggregations under the plasma membrane, which might release the transmitter diffusing towards the longitudinal muscle cells.

(b) Secondary and tertiary strands of the myenteric plexus have vesicle-containing fibres at the surface of the bundle at a short distance from the more internally situated longitudinal muscle cells.

(c) Junctions have been found between muscle cells of the circular muscle layer and muscle cells of the longitudinal muscle layer; these junctions generally have finger-like processes.

(d) There are junctions between smooth muscle cells and the so-called “interstitial cells” (Cajal) which, at other parts of their surface, are connected with nervous structures.

(e) Finger-like processes may protrude from the innermost longitudinal muscle cells and closely approach the external surface of the ganglion.

Quantitative determinations of these various neuromuscular structures are in progress and possible functional implications will be discussed.

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Measurement and printout of average heart rate using digital techniques

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The equipment to be demonstrated was developed in order to study the effects on heart rate of cigarette and cigar smoking. Frequent, accurate and rapid measurements