If the hypogastric nerve is stimulated with a current strong enough to excite *C* fibres, it was regularly found that a synaptically relayed impulse can be recorded in the colonic nerve and occasionally also in another branch of the hypogastric nerve. In some experiments on the curarized ganglion, these reflexes were potentiated after preganglionic tetanization with a current supra-threshold for *C* fibres. Therefore also *C* fibres which traverse the ganglion can give off collaterals capable of exciting the ganglion cells.

After bilateral denervation of the preganglionic nerves, a reflex in the colonic nerve can still be recorded on stimulation of the hypogastric nerve at *C* fibre strength. This finding is consistent with the anatomical and physiological data presented by Kuntz and Saccomanno[3].

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Senility Changes in the Spinal Ganglion Neurones of the Toad, *Bufo regularis*

In a paper on fat, Ciaccio has figured various neurones, some of the toad, containing large spherical hollow bodies, which stain by Sudan III in formalin-fixed postchromed material.

Toads of different ages have been examined by various methods, among which the Kolatchew–Nassonow has provided a good series. The Golgi apparatus of the late tadpoles and the young toads is a canalicular reticulum which is polarized in the tadpoles (Fig. 1). In young toads few granules are visibly attached to the osmiophile reticulum (Fig. 3). As the full-grown toad ages, it is possible to follow the break-up of the canals to form a variable number of large spherical and sub-spherical bodies shown in the initial stage in Fig. 5. One such vesicle is being formed at *X*, by the widening of the canal into a vesicle, and the thickening of one side. In Fig. 7 the process of metamorphosis has become greatly advanced in the old toad, the Golgi reticulum having nearly disappeared. In the senile condition (Fig. 9) the Golgi apparatus has completely degenerated into a number of very large osmiophile vesicles (*v*), which are more concentrated at the cell periphery. These osmiophile vesicles stain clearly in Sudan black *B* in Regaud postchromed material, whereas the Golgi reticulum does not so stain. It is clear, therefore, that in old toads the Golgi material of the spinal ganglion neurones is transformed into lipid. Besides the above-mentioned vesicles, pigment granules are secreted by the Golgi apparatus; these granules are situated in the cell body and finally migrate to the axon hillock region. The mitochondria in the spinal ganglion neurones are granular. A further account of the material is being published elsewhere.

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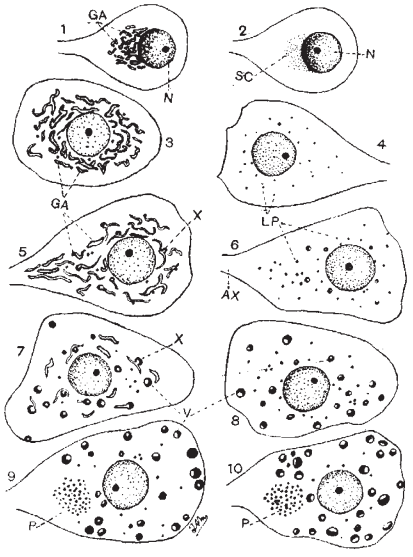

Semi-diagrammatic figures: Left-hand figures from Kolatchew–Nassonow preparations, right-hand figures from Regaud-postchromed Sudan black preparations. Figs. 1–2, tadpole. Figs. 3–4, young toad. Figs. 5–8, full-grown toad. Figs. 7–8, old toad. Figs. 9–10, senile toad. *AX*, axon; *GA*, Golgi apparatus; *LP* (Figs. 4 and 6), ordinary lipid granules (Golgi secretion), xylol-soluble; *N*, nucleus; *P* (Figs. 7–10), pigment granules; *SC*, sudanophile cloud, the area *SC* being non-granular, but slightly sudanophile; *V*, osmiophile and sudanophile vesicles

Giant Nerve Cells in *Lingula*

Elongated invertebrate animals which effect quick muscular contractions, either as a means of rapid withdrawal and escape like some Annelida[1] and Enteropneusta[2], or for the purpose of making sudden darts through the water like the macrurous Crustacea[3] and the squids and cuttlefishes[4], have been shown to possess giant nerve cells and fibres.

Fifty years ago, Morse[5] observed that the two closely allied genera of ecardine Brachiopoda, *Lingula* and *Glottidia*, with long stalks by which they are attached to the bottoms of their tubes in sand or mud, withdraw into their tubes with a quick jerk on an interruption of the light which falls upon them. "The available descriptions of the nervous system in the Brachiopoda give us a picture of the arrangement in a few species but they do not supply in any point the modern demands. . . . About the form and nature of the nerve fibres we know only that the fibre mass is a net-work of fine fibrillæ and that the nerve cells like most cells of the Brachiopoda are very small and therefore difficult to investigate."[6]

However, working with fresh material fixed in Bouin's fluid, sectioned in paraffin and stained with hæmatoxylin and eosin, I have found a small number of giant nerve cells in the subœsophageal ganglion of *Lingula* (see diagram). I hope, by the use of more specific stains for nerve tissue, to be able to trace