

From Teleostei: cells of cord of *Amiurus catus*.

In all cases this substance in the cell body, although distributed differently, stained with toluidin blue and gave the reactions for iron and phosphorus. In all cases tried the substance was found to be insoluble in pepsin and hydrochloric acid but to be easily altered by dilute alkalies.

The widespread occurrence of this substance in such diverse forms has been taken by some (Rohde,⁷⁷ Marinesco⁷⁸) to indicate that this material is an essential constituent of all nerve cells. This, however, is not the case, for in 1895 Bühler⁷⁹ described the cells of the forebrain of *Lacerta agilis* as frequently devoid of Nissl granules, and I find that the vast bulk of the nerve cells of the Urodela are absolutely devoid of them. It will therefore be necessary to enter into a detailed account of the nerve cells of these forms.

Several specimens of *Necturus*, *Amblystoma*, *Plethodon* and *Diemyctylus* were obtained and the cord, brain and ganglia fixed in different fluids. A series of a *Salamandra* larva was also examined⁸⁰ and series of larval *Amblystomata* of various ages were made. The nerve cells of all these different forms were found to correspond in their structure and characters.

In the nerve cells of these animals the cytoplasm, instead of holding granules which contain iron and phosphorus and which stain with basic dyes, is often free from iron, phosphorus or substance staining with toluidin blue, and on the other hand, their nuclei, instead of containing very little basophile substance, abound in granules of such basophile material. This is true of ganglion, retinal and central nerve cells.

If one fixes in Flemming's fluid and stains with his orange method there is no gentian-stained substance in the cell body while the nucleus is filled with granules and threads which stain deeply with the gentian. If instead of the orange method one uses safranin and light green, according to Benda's process, one finds all the substance staining with safranin confined to the nucleus.

In material that has been fixed in alcohol or in sublimate, and stained

⁷⁷ Rohde, Lc.

⁷⁸ Marinesco, G. "Recherches sur la biologie de la cellule nerveuse," Arch. r. Anat. und Phys., Phys. Abth., 1899, p. 89.

⁷⁹ Bühler, Anton, "Protoplasma-Struktur in Vorderhirnzellen der Eidechse," Verh. d. phys. med. Ges., Würzburg, Stahel, 1895.

⁸⁰ For this privilege I am indebted to Dr. J. Stafford.