these bodies can be easily followed. I find it is not the accessory nucleoli that retain the stain but the ordinary nucleoli themselves. In all places examined by Rohde (spinal and sympathetic ganglia) it is well known that several nucleoli are found, as can be easily seen by staining with toluidin blue. In the cells of the cord where one nucleolus is the rule, it is this nucleolus which retains the iron-alum hæmatoxylin stain, and not the neighbouring oxyphile substance.

If these nucleoli which retain the hæmatoxylin stain are outside the nuclear membrane they are artificially brought there. One can sometimes find, as v. Lenhossek has pointed out, the nucleolus pulled out of the spinal ganglion cell. He believes this occurs because the nucleolus is loosely attached to the linin thread, or because the nucleolus is very hard under certain conditions. I have never seen a nucleolus outside the nuclear membrane in the cells of the cord, and in ganglia that have been fixed in sublimate this appearance is far more common than it is in material that has been fixed in alcohol. The fact, (and I have carefully examined my preparations to see that it is a fact), that where more than one cell have their nucleoli displaced in the same section the direction of the displacement of the nucleoli is always the same, shows that these have been displaced in cutting. One can make the appearance of migrating nucleoli quite common, if one cuts sections, 1 or 2 μ thick, of ganglia fixed in sublimate, but all the apparent migration is in the same direction. If, however, thicker sections are cut, or if material that has been fixed in alcohol is used, the appearance may be said to be non-existent.

Holmgren[88] also believes in the migration of formed masses of the nuclear chromatin to the cytoplasm. In the cells of the spinal ganglia of *Lophius* he has described the migration of the chromatin out of the nucleus to form the Nissl granules, the migration of accessory nucleoli, and the passage of the Nissl granules back into the nucleus These changes are brought about through the agency of the micro-centre with its radiating threads, and are supposed to be different stages in the activity of the cells. Some of the cells observed so differed from the usual condition that they could only be considered as dying, and yet it is from cells in the same ganglia that these changes are described. Holmgren tries to justify his position by a study of the cells of *Acanthias*, *Gadus*, *Raja*, and *Rana*, in which similar conditions were observed. In the spinal ganglion cells of *Rana* I have never observed such conditions, except in cases which are manifestly artifacts made in cutting, as

88 Emil Holmgren, "Zur Kenntniss der Spinalganglienzellen von Lophius piscatorius Lin." Anat. Hefte, XXXVIII, p. 71, 1899.