

Held³³ found the granules are insoluble in weak or in concentrated mineral acids. Eve³⁴ observed that acids had a slight dissolving action on the granules.

Acids have a marked action on the granules and nuclear contents. One way to detect the presence of iron in the cell is to treat the sections with acid alcohol, when the iron can be detected by ordinary reagents (*vide ante*). If the sections are left in the acid for longer time all the iron will be extracted from the cell and then on staining them with eosin and toluidin blue, no blue-stained substance will be seen, the result being the same as if unaltered cells were stained with eosin alone. There are no vacuoles in the cell and the granules may still be detected with Heidenhain's hæmatoxylin stain. After all iron has been extracted from the cell the granules in the cytoplasm, the nucleolus and the oxyphile nuclear substance still contain phosphorus.

The action of alkalies on the cell has been studied by Held.³⁵ Eve,³⁶ Bühler³⁷ and Ruzicka.³⁸ Held and Bühler find the granules are first altered in their staining powers and then are soluble in alkalies, forming vacuoles in the cell where the granules were originally. Eve is doubtful whether the granules are soluble in the alkalies or are merely altered in their staining powers. Ruzicka finds the granules are insoluble in alkalies and are not altered in their staining properties.

After treatment with alkalies the granules, I find, do not stain blue with toluidin blue or do not give an iron reaction, but most cells do not contain vacuoles. Since alkalies detach sections from the slide, either loose sections of spinal ganglia were used, or thin pieces of material which had been fixed in alcohol were left in the alkali for the desired time and then washed, dehydrated and imbedded. As alkalies the following solutions were employed: sodium hydrate 0.25 per cent., 0.5 per cent. and 1 per cent.; potassium hydrate, 0.2 per cent. and 0.5 per cent. and lithium carbonate in saturated aqueous solution. Held³⁹ figures a vacuolated cell obtained by leaving a thin piece of cord in saturated lithium carbonate for four days. Material was left in lithium carbonate solution for as long as ten days and yet no vacuoles were

³³ Held, Arch. f. Anat. u. Phys., Anat. Abth., 1895, p. 396.

³⁴ L. c.

³⁵ Held., H. Arch. f. Anat. u. Phys., Anat. Abth., 1895, p. 396, and 1897, p. 204.

³⁶ Eve., l. c.

³⁷ Bühler., l. c.

³⁸ Ruzicka, Vladislav, "Untersuchungen, über die feinere Structur der Nervenzellen und ihrer Fortsätze," Arch. f. Mik. Anat., LIII, P. 485, 1898.

³⁹ Held, l. c., 1895, Fig. 10.