The vacuolization, due to water assumption by the cell membrane, whose permeability was altered by the inhibition of its enzymatic systems, was not reproducible in typical fibroblast cultures, suggesting that the cells vacuolized in the cultures of spinal ganglia had to be identified with glial cells that had lost in vitro their morphological but not biochemical differentiation. This supports the view that the Na^+-K^+-dependent ouabain-sensitive ATP-ase is mainly localized on the glial cell membrane.

The relationship between these researches and the previous ones by BIGNAMI and PALLADINI on the in vivo and in toto inhibition of the central nervous system transport enzymes is discussed in connection with the problem of glio-neuronal interrelations.

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The Number of Neurons, Glial and Perineurium Cells in an Insect Ganglion

The number of neurons, glial and perineurium cells was counted in a complete series of microscopic sections of the second abdominal ganglion of the stick insect (*Carausius morosus* Br.). The series consisted of 34 sections embedded in paraffin, cut sagittally at 7 μ and stained with methyl blue-eosin. Each cell was identified by direct high power ($\times$ 900) microscopy and marked on a photomicrograph ($\times$ 327) of the same section. Three different methods (counts A, B and C) were used for counting. All methods were based on the presence of the nucleolus[1]. Since the mean diameter of the nucleoli was about 2.5 μ, there was little probability of counting the same cell more than once in serial sections. In *count A* all cells with a clearly visible nucleolus were counted (Table I).

Often it was impossible to ascertain the nucleolus of a given cell; therefore *count B* was undertaken, in which all cells with a nucleolus were counted, and in addition, if it was not visible, the cell was counted on the section where the largest diameter of the nucleus was lying. This count, also presented in Table I, yielded a smaller number of glial cells because these cells are often densely crowded together, their nuclei are of smaller diameter, and the chromatin of the nuclei is sometimes densely packed, so that the nucleolus could not be discriminated. In some cases there were two or three nucleoli in one nucleus.

A reliability test was made in *count C*: in a single section which contained a large cell population each cell was counted, if the nucleolus was visible or the maximum diameter of the nucleus was lying on this section. In some instances, up to ten adjacent sections were compared. Poorly stained cells, not counted in *count A* and *B*, were also counted by this method. Table II demonstrates the result of this count and of *count B* obtained from the same section. Comparison of the two counts indicates that *count B* yielded 9% fewer neurons, 27% fewer glial cells, and 4% fewer perineurium cells. By extrapolation of the data of *count C* one finds for the whole ganglion: 663 neurons, 1184 glial cells and 539 perineurium cells; total 2386 cells.

FIELDEN and HUGHES[2] found 600 neurons in a typical abdominal ganglion of a dragonfly nymph. However, in their study, as well as in other investigations by previous authors, glial and perineurium cells have not been included.

The following ratio between the three types of cells was found:

Count	Neurons	Glial cells	Perineurium cells
B	1	1.5	0.8
C	1	1.8	0.8

With a compensation polarimeter the total cross-sectional area of the whole ganglion was measured and multiplied by the thickness (7μ) of the sections. The volume of the ganglion was $140 \cdot 10^{-4}$ mm^3. The volume of the neuropil was determined analogously and found to be $77 \cdot 10^{-4}$ mm^3. By subtraction, the volume of the cell cortex turned out to be $63 \cdot 10^{-4}$ mm^3.

Table I. Total count

	Neurons	Glial cells	Perineurium cells	Total
Count A	443	1007	304	1754
Count B	608	934	519	2061

Table II. Sample count

	Neurons	Glial cells	Perineurium cells	Total
Count B	22	41	26	89
Count C	24	52	27	103

Zusammenfassung. Im zweiten Abdominalganglion der Indischen Stabheuschrecke (*Carausius morosus* Br.) wurden 600 $\pm$ 50 Neurone, 1000 $\pm$ 100 Gliazellen und 500 $\pm$ 30 Perineuriumzellen, zusammen etwa 2100 Zellen gezählt. Die Volumina des Ganglions, des Neuropilems und des Zellcortex betrugen etwa: $140 \cdot 10^{-4}$ mm^3, $75 \cdot 10^{-4}$ mm^3 und $65 \cdot 10^{-4}$ mm^3.

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