are less permeable in immature animals than in adults. WEBBER and BLACKBOURN[15] have shown that in the immature glomeruli at the periphery of the cortex in newborn rats there are few capillary fenestrations and these are impermeable to ferritin, although not to horseradish peroxidase. Other authors have found evidence for an increase of glomerular permeability with age in the rat[16] and in man[17]. It is also possible that age changes affecting the amount of silver deposited in the glomeruli may be due to the increase with age of the glomerular filtration rate[18–20]. This would not, however, explain the age differences noted in the medulla.

No explanation can be offered for the two adult rats in which no deposition of silver could be observed after 6 weeks administration. A similar anomaly has been reported by WALKER[21] who reviewed reports by several other workers and concluded that approximately 3 in every 100 Sprague Dawley rats deal atypically with ingested silver. The significance of the change in permeability to protein of the blood vessels in the growing rat reflected by the deposition of silver and extravasation of Evans blue[13] is difficult to understand at present since the amount of filtered protein and its subsequent fate in the kidney is controversial[22–24] and much more work is necessary before reasonable speculations can be made on its functional importance.

Résumé. Si l'eau potable est additionnée de 0,15 % de nitrate d'argent, l'argent se dépose dans les reins des rats immatures plus lentement et en moins grande quantité que chez les adultes, et ces granules sont partout plus petits. Il est probable que ces résultats indiquent un abaissement de la perméabilité des capillaires chez les immatures.

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High Nuclear DNA Content in Nervus Terminalis Ganglion Cells of *Scorpaena porcus*

A peculiar type of ganglion cell, belonging to the nervus terminalis system, was observed in the rostral half of the olfactory bulbs in Scorpaenidae (Pisces Perciformes). These neurones, 2 to 12 in number, were found within the ventro-medial wall of each bulb, were elongate in shape and often so closely in contact with one another that the boundaries between them could hardly be distinguished[1]. The most striking peculiarity of these nerve cells was the polymorphism and size of their nuclei, that (Figures 1–3) are so deeply indented as to suggest binuclearity. The nuclear diameter, as measured on paraffin sections after Bodian silver stain, was found to vary from 13,2 to 26,2 µm. One to 3 nucleoli may be present, that in electron micrographs (Figure 4) appear of remarkable size, roundish shape, and rather uniform fibrillo-granular texture.

These observations prompted us to measure the Feulgen positivity of these nuclei in order to test whether they contained a higher amount of DNA than the nuclei of other neurones in the same area[2]. Despite repeated attempts to dissociate the tissue, the extreme paucity of the cell population made it impossible to obtain a smear in which a monolayer of neurones could be studied; the histophotometric measurements were therefore performed on paraffin sections of specimens fixed in Carnoy. Serial sections of 8 µm from 10 olfactory bulbs of *Scorpaena porcus* were Feulgen stained and optical density (OD) measurements were performed by means of a Barr and Stroud GN 2 integrating microdensitometer[3]. Camera lucida drawings showed that the majority of the big nuclei under examination appeared in 2 to 3 consecutive sections: by adding the OD values for each section it was therefore possible to know the total OD for each nucleus. Within the population of nerve cells studied, only those nuclei were considered that were isolated enough, in all the sections, to guarantee that there was no overlapping or interference in the field of measurement. This choice reduced the number of acceptable values to 17. As reference elements the nuclei of the granule cells were chosen, since their Feulgen-positivity appeared constant (OD = 3) and could therefore be assumed to be diploid (2c).

From the Figure 5 it is apparent that: a) most of the OD values were found between 64c and 128c, i.e. the DNA content of most nuclei appeared to be 32 to 64 times higher than that of the granule cells; b) no value was found below 16c, although some of the measurements had been performed on the smallest elements of the cell population; c) in 2 cases the DNA content was found to approximate 256c. Although the limited number of data does not allow us to refer the values obeserved to true frequency classes, nor to express our results in terms of degrees of ploidy, the presence can be pointed out of a clear gap between the group of nuclei around 128c and those around 256c, which appears suggestive of a two-fold increase.

In the search for a functional interpretation to the striking nuclear development of the neurones described here, it is necessary to consider the more general situation of this kind of ganglion cell within the Perciformes. In this order of Teleostei, infact ROSSI and BASILE (in preparation) have observed a remarkable variability in the number and size of the nuclei, 2 parameters that seem to be inversely related, and in which respect the Scorpaenidae represent an extreme case, i.e. maximal nuclear size and extreme reduction in number. We would therefore relate the nuclear increment observed to the functional overlaod to which these elements are subject. Such an interpretation is on the other hand in accordance with

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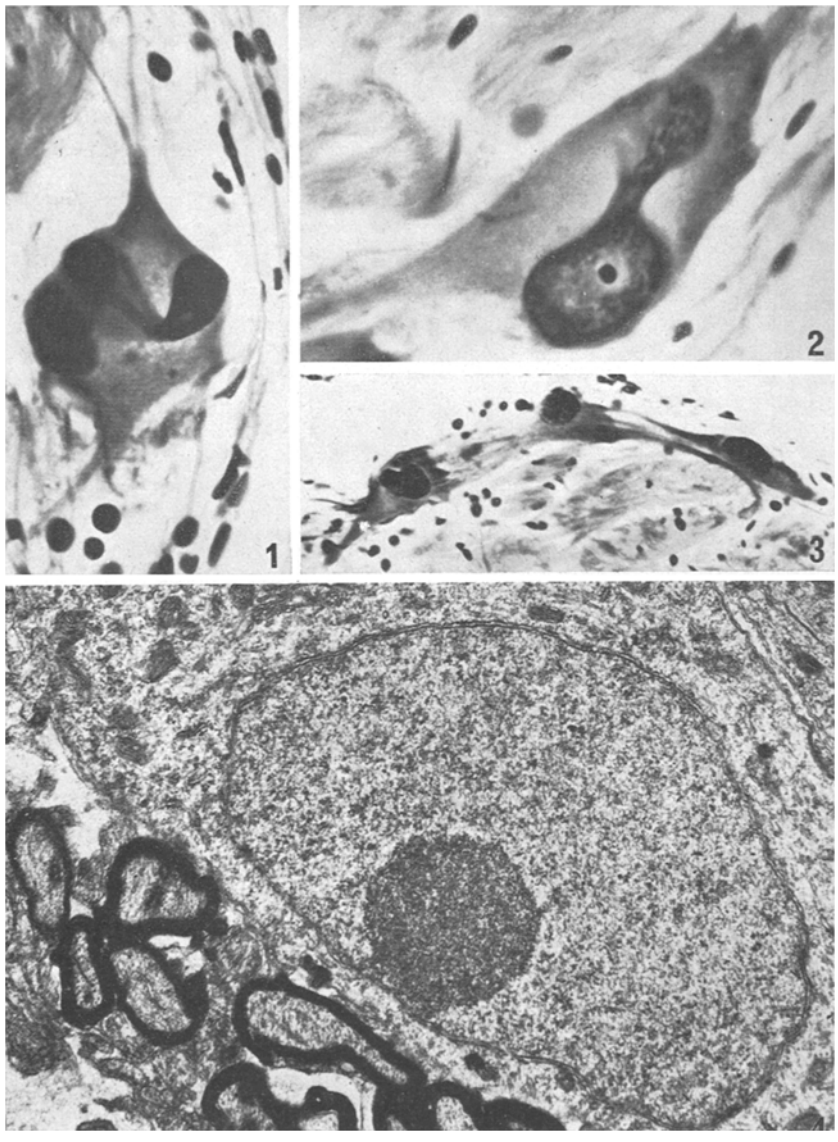
[3] The instrument was kindly put at our disposal by Dr. A. BRUNORI of the Centro di studi nucleari della Casaccia (CNEN), to whom we are greatly indebted.



Nervus terminalis ganglion cells in *Scorpaena porcus*, L. M. and E. M. Fig. 1. Bodian stained section; ×287. Fig. 2. Bodian stained section; ×367. Fig. 3. Bodian stained section; ×94. Fig. 4. Formaldehyde-glutaraldehyde fixation, postfixation in osmium, uranyl acetate and lead citrate stain; ×11,200.

that of other described cases of high DNA content in vertebrate neurones, such as Betz cells, cerebellar Purkinje cells and anterior horn cells in the cat[4], hippocampal neurones in the rat[5], Purkinje cells in the rat[6] and in man[7]. A parallel interpretation can also be postulated for fish Mauthner cells, in which STEFANELLI and BAFFONI[8] observed a high nuclear development and the presence of 2–3 nucleoli.

It should however be pointed out that in all the cases mentioned so far a single doubling of Feulgen-positivity was observed, nor do we know of any report describing such a striking increase in nuclear DNA for vertebrate neurones as we observed in *Scorpaena porcus*. The only report on exceptionally high DNA content in nerve cells is in fact, to our knowledge, that of LASEK and DOWER[9] who were able to identify 2 nuclear classes in *Aplysia californica* neurones, characterized by a DNA content 8 times and 16 times higher than the diploid amount.

Zusammenfassung. Gewisse Ganglien-Zellen von *Scorpaena porcus* weisen einen DNA-Gehalt auf, der 32 bis 64 mal höher ist als derjenige von normalen Neuronen.

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18 July 1972.

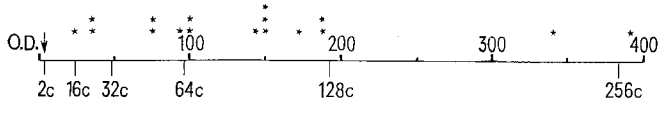

Fig. 5. The OD values (*) of the 17 nuclei studied are indicated; as a reference the sequence of the hypothetical ploidy degrees is also given. The arrow points at the mean OD value of the granule cells.

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