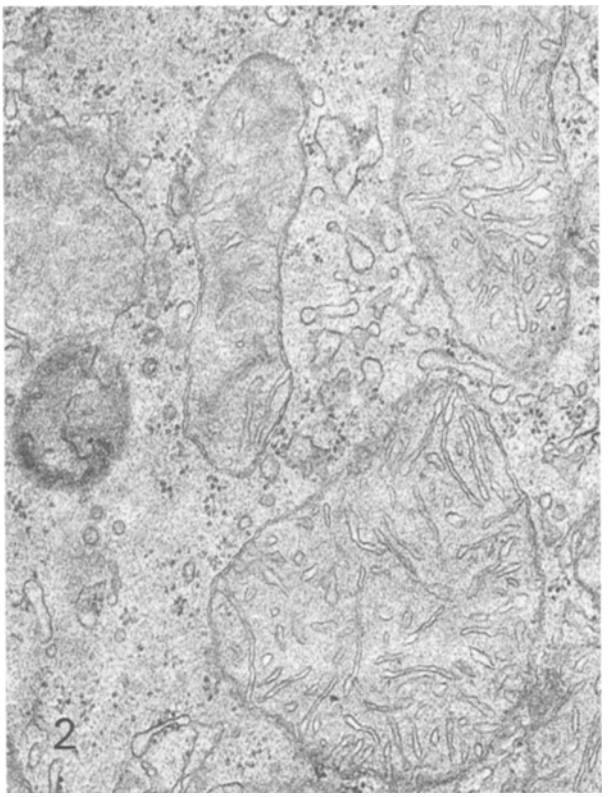

Fig. 2. Mitochondria from an animal exposed for 7 days to 100% oxygen at 600 mm Hg are shown. × 35,000.

the mitochondria, although alternative substrates including glucose, fructose, mannose, pyruvate and acetate can be utilized. JOANNY et al.[9] report an inhibition of tissue oxidative reactions and an increase of lipid peroxides in cerebral cortex slices exposed to hyperbaric oxygen. Altered mitochondrial metabolism caused by oxygen exposure at 600 mm Hg theoretically should account for the changes observed in mitochondrial ultrastructure[10].

Résumé. Des rats ont été maintenus dans une athmosphère d'oxygène pur sous une pression de 600 mm de mercure durant des périodes de 3 et 7 jours. Les observations faites au microscope électronique sur les tissus prélevés dans le rein ont montré qu'après 7 jours de traitement les mitochondries et les particules de corps gras ont subi dans la cellule d'importantes modifications. Après 3 jours seulement, on n'observait accun changement de l'ultrastructure.

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Monoamine-Containing Structures in the Nerve Cord of Some Representatives of Diptera (Insecta)

The fluorescence histochemical method developed by FALCK and HILLARP[1,2] has made possible the study of the cellular localization of some biogenic monoamines. The first positive results in certain representatives of the class of insects by this method were obtained by FRONTALI and NORBERG[3], PLOTNIKOVA and GOVYRIN[4], FRONTALI[5], KLEMM[6,7], CHANUSSOT et al.[8]. If there is no doubt about the presence of catecholamines in the brain and the stomatogastric nervous system in insects, the same cannot be said, for the time being, about the nerve cord ganglia. The experiments performed by the authors cited above have not yielded any answer to this question. That is why we have tried to augment our knowledge in this field. The histochemical demonstration of catecholamines was performed partly on whole mounts of the ventral nerve cords, partly on serial sections from lyophylized individuals.

Our observations were made on larvae of the same developmental stage – before the pupation – of 2 representatives of dipterous insects, i.e. *Simulium argyreatum* (Simuliidae) and *Ptychoptera contaminata* (Ptychopteridae), both from the suborder of Nematocera.

In the preparation of whole mounts of the ventral nerve cords for the relevant studies, we proceeded so as to observe the conditions recommended by MALMFORS[9]. The actual preparation of nerve cords was performed with the aid of a dissecting microscope and never lasted longer than 10 min. The isolated cords were melted onto dry glass slides and dried for 1 h in a vacuum over phosphorus pentoxide. The dried nerve cords were treated with dry formaldehyde gas (paraformaldehyde store at 70% humidity) for 1 h. After they had been mounted in liquid paraffin, they were evaluated in a fluorescence microscope with Schott BG 12 and OG 4 filters. The

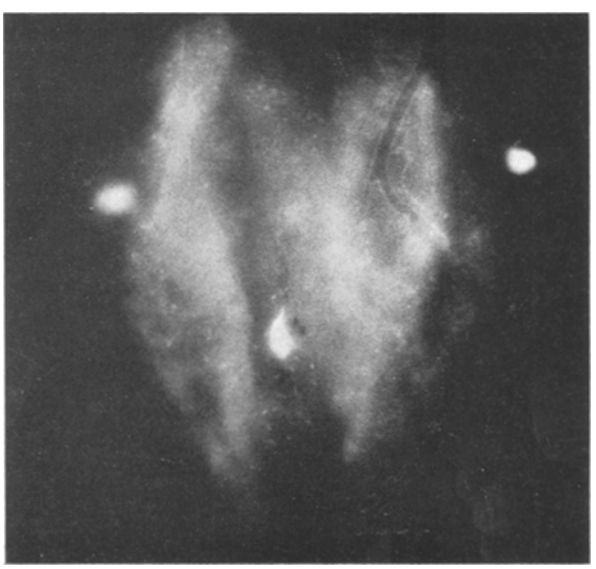

Fig. 1. 3 fluorescent regions in the first abdominal ganglion of the nerve cord of *P. contaminata*, a whole mount.

specificity of the histochemical reaction was tested by omitting of formaldehyde gas and by H_2O-test.

We have found monoamine-containing regions in the species studied, both in the thoracic and in the abdominal ganglia of the nerve cords. In *Ptychoptera contaminata* 3 such regions, situated in the corners of an imaginary triangle with the base facing the front edge of each ganglion, were noticed (Figure 1). A similar arrangement of catecholamine-containing regions was also displayed by most ganglia of the species *Simulium argyreatum*. Only the first and second thoracic ganglia have one specifically fluorescent region lying approximately in their centres. Differences in the distribution and in the number of monoamine-containing cores were established in the suboesophageal ganglia of the species under study. While the suboesophageal ganglion of *Simulium argyreatum* stood out for the constant presence of 2 pairs of symmetrically located fluorescent cores, we found in the suboesophageal ganglion of *Ptychoptera contaminata* only one pair, situated in the longitudinal axis of the ganglion. Nerve fibres with typical varicosities were noticeable in all interganglionic connectives of both observed species (Figure 2).

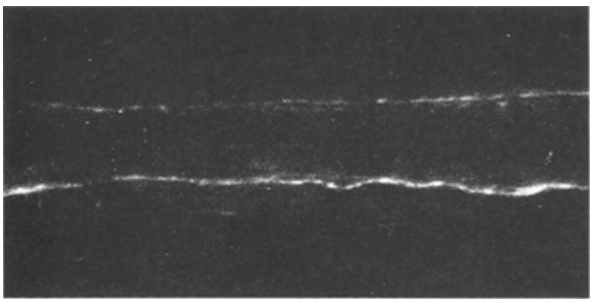

Fig. 2. Catecholamine-containing nerve fibres in the interganglionic connectives between the first and the second abdominal ganglia of *S. argyreatum*, a whole mount.

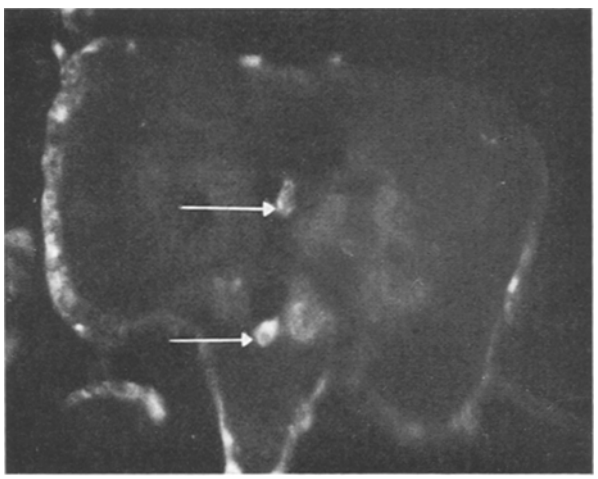

Fig. 3. A longitudinal section of the suboesophageal ganglion of *S. argyreatum*. Note 2 fluorescent cells in the midline (arrows).

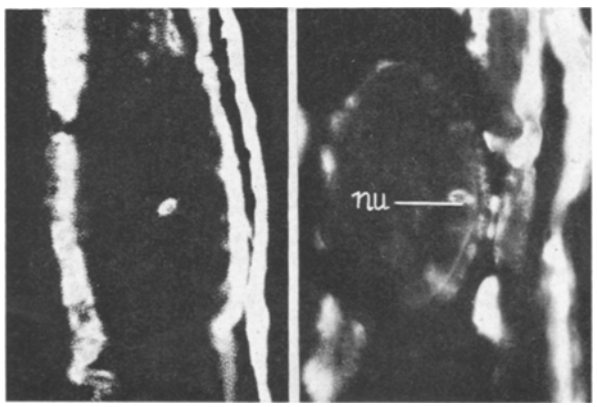

Fig. 4. The fluorescent cell in the centre of the second thoracic ganglion of *S. argyreatum*, a sagital section.

Fig. 5. A sagital section of the first thoracic ganglion of *S. argyreatum*, showing the ventral located fluorescent cell with non-fluorescent nucleus (nu).

The localization of catecholamines in histological sections was studied on *Simulium argyreatum* larvae. Their lyophilization was performed by the standard technique, recommended by Falck. In the preparation of serial sections for evaluation, we availed ourselves of the experience made by Masuoka and Placidi[10], who found that sections melted onto glass slides provided with an Entellan coat could be evaluated directly in a fluorescence microscope, without previous removal of the paraffin. The preliminary results are shown in Figures 3, 4, and 5. The absence of fluorescent material in the site of the location of the probable nucleus (Figure 5) indicates that specifically fluorescent cores from whole mounts of nerve cords are composed of the adrenergic neurons. With regard to the fact that the structures studied showed green fluorescence, we concluded that the ascertained catecholamine was noradrenaline and/or dopamine.

The findings just described confirm the presence of adrenergic nerve structures in the ventral nerve cords of insects. The functional explanation of their significance is difficult, for the time being, and without augmentation by findings made in other species, as well as more detailed information on the spatial distribution and the actual number of the adrenergic cells in each ganglion, is almost impossible. A paper dealing with these questions is being prepared and will be published later.

Zusammenfassung. Mit Hilfe einer fluoreszenzmikroskopischen Methode wird an zwei Nematocera (*S. argyreatum* und *P. contaminata*) gezeigt, dass bestimmte Stellen des Unterschlundganglions und die Ventralganglien biogene Monoamine (wahrscheinlich Dopamin und Noradrenalin) enthalten. Adrenergische Nervenfasern wurden auch in den Konnektiven nachgewiesen.

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