their lipid content. BHAT[6] recently reported that in the flight muscles of the dragonfly *Brachythemis contaminata* fat was confined mostly in the fibres present towards the centre of the muscle bundle, whereas glycogen was found to be concentrated in the peripheral fibres of the same muscle bundle. The functional significance of this variation in the size and the content of metabolites in the muscle fibres of these insects is not yet clearly understood. In fact, very little information is available on the metabolism in these different types of muscle fibres. Further experimental studies would be necessary before drawing any definite conclusions in this regard.

Zusammenfassung. In Flugmuskeln von *Belostoma* sp. und von *Periplaneta americana* kommen neben den normalen Fasern auch abnorm grosse Fasern vor. Diese Riesenfasern zeigen gegenüber Sudanschwarz B das gleiche färberische Verhalten wie die Normalfasern.

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The Effect of Experimental Removal of the Tensor Tympani Muscle on the Ipsi- and Contralateral Mesencephalic Nuclei of the Trigeminal Nerve in the Albino Rat

Silver impregnation reveals pseudounipolar (T-shaped process) cells along the nerve serving the tensor tympani muscle in *Epimys norvegicus var. albina* (Erxl.) and *Erinaceus europaeus* (L.)[1]. The observation of annular and spiral free nerve endings on the perimeter of some muscle fibres in these two species, and the absence of typical neuromuscular spindles[1,2], have suggested that these cells are proprioceptive in function.

The site of these sensory neurons is atypical, and it may be that they are Gasserian ganglion cells that have migrated during development[1]. Yet the well-known proprioceptive nature of the mesencephalic nucleus of the trigeminus makes it equally likely that this may be the site from which such migration began; cell migration from this nucleus both within and outside the brain stem has been reported by ALLEN[3], WEINBERG[4], and others.

On the other hand, the fact that tensor tympani nerve cell numbers may vary in different individuals of the same species suggests that nerve cells having the same peripheral distribution territory are able to maintain their original central position. This would agree with the data concerning ipsilateral trigeminus mesencephalic nucleus cell chromatolysis observed by WILLEMS[5] following tensor tympani nerve section in the rabbit.

The aim of the present research was to discover whether removal of the rat tensor tympani muscle was followed by secondary effects on the mesencephalic nucleus of the trigeminus. It was considered that the observation of such effects would indicate that this muscle possesses sensory innervation, and that its internal neuromuscular devices can be classed as proprioceptive.

30 adult albino Sprague-Dawley rats (*Epimys norv., var. albina* Erxl.) with disease-free ears were employed. Following narcosis with ether, the left tensor tympani was resected. Access to the middle ear was obtained via an opening in the lower wall of the 'bulla tympani'; the muscles in the operative area were left intact. The pons and mesencephalon were removed on the 14th to 17th day and fixed in Bouin's fluid or mercuric chloride. After embedding in paraffin, serial sections were taken and stained with an 0.5% aqueous solution of toluidine blue. The pons and mesencephalon of normal control animals were fixed in 12% neutral formalin and treated with Bielschowsky-Boeke's nervous tissue silver impregnation method. This showed that the mesencephalic nucleus was in fact formed of pseudounipolar cells (Figure 1).

3–5 cells in certain total chromatolysis (Figure 2, a) were observed in ipsilateral mesencephalic nucleus sections from 20% of the series, usually in the caudal half of the cell column. These cells had a size range of 46×28 to 28×20 µ. The same subjects also presented chromatolytic cells in the contralateral nucleus (Figure 2, b), though here cell numbers were constantly less (2 per animal). Site and size data, however, were unchanged.

These results indicate that sensory innervation of the rat tensor tympani muscle may be dependent on neurons situated in the mesencephalic nucleus of the trigeminal nerve. The low percent of nuclear reactions observed in our series may be attributable to the fact that tensor

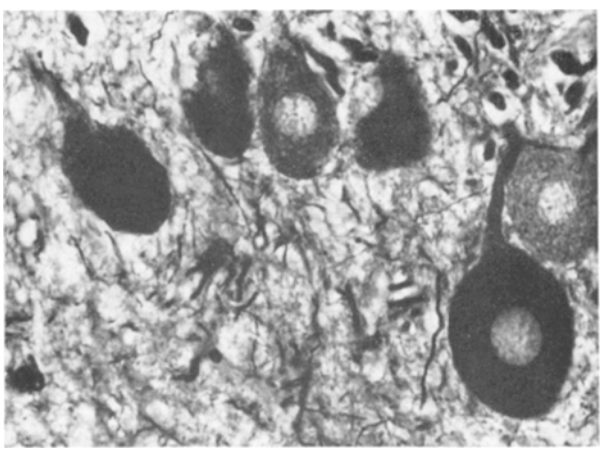

Fig. 1. *Epimys norv. var. albina* (Erxl.). Control animal. Mesencephalic nucleus of the trigeminal nerve: oval cell body with regular border due to absence of dendrites; note that only one process is extended (pseudounipolarity). Silver impregnation according to Bielschowsky-Boeke. × 600.

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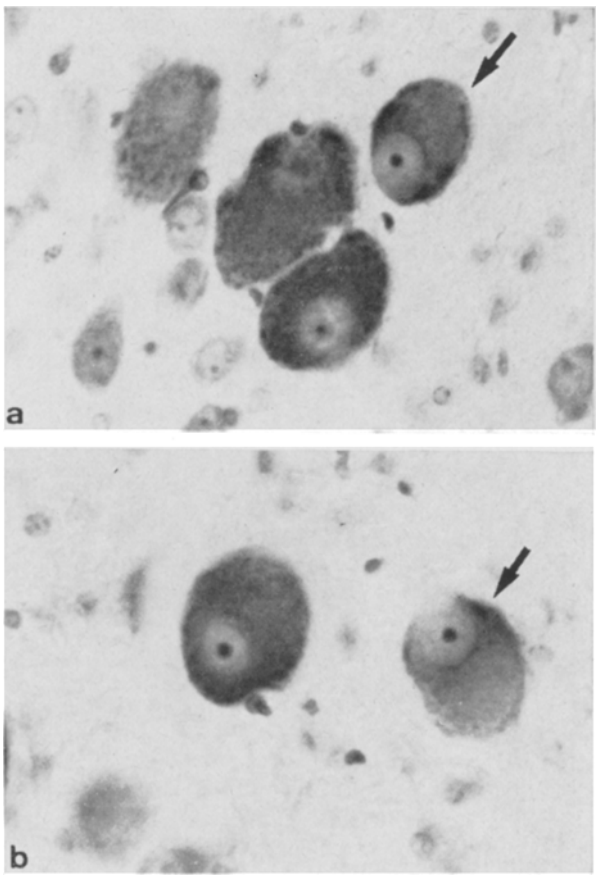

Fig. 2. *Epimys norv. var. albina* (Erxl.). a) Animal sacrificed 17 days after removal of left tensor tympani muscle. Ipsilateral mesencephalic nucleus of the trigeminus: chromatolytic nerve cell. b) Animal sacrificed 17 days after removal of left tensor tympani muscle. Contralateral nucleus: chromatolytic nerve cell. Toluidine blue. × 600.

tympani neuromuscular devices were not always present. It is also felt that the absence of nuclear chromatolytic cells should not be considered as a negative finding, since it agrees with the observation of cell migration along the nerve serving the muscle of the malleus[1]. The very small number of first-order neurons on the tensor tympani proprioceptive pathways, coupled with such migration, offers a satisfactory explanation of their absence in the central nucleus.

The present study has shown that first-order sensory neurons are situated in the ipsilateral and, though to a lesser degree, in the contralateral mesencephalic nucleus. This result agrees with experimental[6] and electrophysiological[7] findings concerning the proprioceptive innervation of the masticatory muscles in the cat.

This demonstration of crossed proprioceptive innervation of the tensor tympani is of practical importance in that it suggests the anatomical basis of a reflex mechanism in the bilateral control of acoustic transmission apparatus adaptability[8].

Résumé. Chez le rat, *Epimys norv. var. albina* (Erxl.), l'excision unilatérale du muscle du marteau provoque l'apparition de la chromatolyse dans des cellules du noyau de la racine mésencéphalique du trijumeau homo- et contro-latéral, ce qui démontre l'innervation sensitive (probablement proprioceptive) croisée.

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Tyrosine Hydroxylase Activity in a Transplantable Islet Cell Tumour of Golden Hamster

A transplantable islet cell tumour in golden hamster originally described by KIRKMAN[1] has recently been found to contain dopa, dopamine, and 5-hydroxytryptamine[2]. Furthermore, enzymatic analyses have shown that tumour cells contain dopadecarboxylase and monoamine oxidase activity[3].

To investigate whether the tumour cells also contain an enzyme system catalyzing the conversion of tyrosine to dopa, the following study has been undertaken.

The islet cell tumour was transplanted s.c. to adult golden hamsters of both sexes, and the tumours were allowed to grow for 4-12 weeks. The tumours of 22 animals were analyzed chemically, as can be seen in the Table. To study the tyrosine hydroxylase activity the tumour was gently homogenized in sucrose and then incubated in the presence of L-tyrosine $^{14}C(U)$ 80 min as described by NAGATSU et al.[4]. The catechol derivatives present in the incubation medium were isolated on Al_2O_3 according to ANTON and SAYRE[5], and the labelled catechol derivatives formed during the incubation were finally estimated in a scintillation spectrometer. In each experiment blank values were obtained in the same way as described above with the exception that the homogenized tissue was boiled for 5 min.

To differentiate between tyrosine hydroxylase and tyrosinase activities[4] inhibitors or activators of one of these enzymes were added to the incubation medium. Tetrahydrofolic acid was used as activator of tyrosine hydroxylase and 2, 2′-bipyridyl and H22/54 (α-propyldopacetamide) as inhibitors of tyrosine hydroxylase. Thiourea was used as a tyrosinase inhibitor[5]. The dopa decarboxylase inhibitor (m-hydroxybensylhydrazine)

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