no difference was observed around the lesioned site between any of the 5 animals. In all 5 animals, only a slight increase in the number of gitter cells was observed in the area immediately surrounding the lesion. Normal tissue, without any further obvious increase in glia cells, was found adjacent to this area.

The results show that merely increasing the permeability of the blood-brain barrier is not sufficient to permit the induction of a localized goldthioglucose lesion. These findings give no support to the hypothesis of PERRY and LIEBELT[6] (which incidentally does not explain why only goldthioglucose would go through a 'weakened' blood-brain barrier site). Their hypothesis also is inconsistent with the prevention of lesions in rats made diabetic by alloxan and then administered goldthioglucose[10]. The view that the VMN contains glucoreceptors remains the more probable. That goldthioglucose may be found to act in other localized areas may mean that such areas also contain glucoreceptors. The multiplicity of physiological functions dependent on neural glucose sensors (e.g. control of epinephrine secretion, supererogatory control of insulin secretion) make the existence of a number of such glucoreceptive areas possible[11,12].

Résumé. Après avoir augmenté la perméabilité corticale sang-cerveau chez des rats, on a donné à ces animaux une injection d'aurothioglucose. Aucune lésion due à l'aurothioglucose n'a été decouverte dans aucun des sites de perméabilité accrue. Les résultats montrent que la production de lésions par l'aurothioglucose n'est pas due à une permeabilité non-specifique dans certains sites hypothalamiques; ils confirment la théorie glucostatique qui suggère qu'il existe des glucorécepteurs à affinité définie situés à ces sites.

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The Fiber Spectrum of the Cat VI Nerve to the Lateral Rectus and Retractor Bulbi Muscles

The VI nerve of the cat supplies the lateral rectus muscle and the 4 slips of the retractor bulbi. Histologically, 3 muscle fiber types have been found in the lateral rectus on the basis of sarcoplasmic reticulum, myofibril size, and size and distribution of mitochondria[1]. In the retractor bulbi, only a single fiber type has been observed[2].

Although VI nerve fiber spectrum studies have been reported[3,4], they have not included the supply to the retractor bulbi. In view of the differences between lateral rectus and retractor bulbi muscle fiber types, the spectrum of the nerve fiber supply and the innervation ratio were investigated, in order to correlate extraocular nerve and muscle fiber types.

Methods. In 4 cats (2.3–2.6 kg in weight), following a lethal dose of Diabutal, the VI nerve was fixed in situ by perfusion via the carotid arteries with 5% glutaraldehyde buffered with 0.15 m sodium cacodylate and post fixed in osmium tetroxide buffered with phosphate. Nerve cross-sections were taken (1) at the exit of the VI nerve from the brainstem, (2) at the entrance of the VI nerve to the lateral rectus, and (3) of the branch to the retractor bulbi at its emergence from the VI nerve. All sections were made before the occurrence of intramuscular splitting. Specimens were embedded in araldite. Cross-sections of 0.5–0.7 μ were cut and stained by Richardson methylene blue method. Fiber diameter, including myelin sheath, was measured by superimposing clear plastic circles of known diameter over photographs enlarged 2000–2500 times. 4 nerves were analyzed at each of the above 3 levels. Total fiber number was counted and a sample of 500 fibers/nerve was measured, except in the retractor bulbi supply, where the total supply, always under 500, was measured.

ALVARADO (unpublished results) has determined the muscle fiber count of 1 superior lateral slip of the retractor bulbi. To derive an innervation ratio utilizing his count, it was necessary to determine the proportion of the total retractor bulbi contributed by the superior lateral slip. Thus, in 3 cats, the 4 slips were dissected out and weighed.

Results. The Figure presents the distribution of fiber diameters at the 3 levels of the VI nerve. Data are based on averages from 4 cats of measurements of 500 fibers per nerve (except for the retractor bulbi) and are plotted as % of total fibers at each level in 1 μ increments. Fiber diameters ranged from 1–21 μ for each level, with the distribution in the branch to the lateral rectus being similar to that of the cranial section of the VI nerve. Spectra at these 2 levels indicate an initial peak at 3–4 μ, a secondary peak at 6 μ and a smooth extension to 21 μ. In contrast, the branch to the retractor bulbi reveals a concentration of fibers between 6 and 14 μ.

The Table presents the total fiber count of each 4 nerves at the cranial level and in the branches to the lateral rectus and retractor bulbi. It will be noted that approximately 7 times as many fibers innervate the lateral rectus as the retractor bulbi.

Many fibers from 1–5 μ in size in the cranial and the lateral rectus sections had thin myelin sheaths in contrast to the thick myelin around the larger axons. The ratio of

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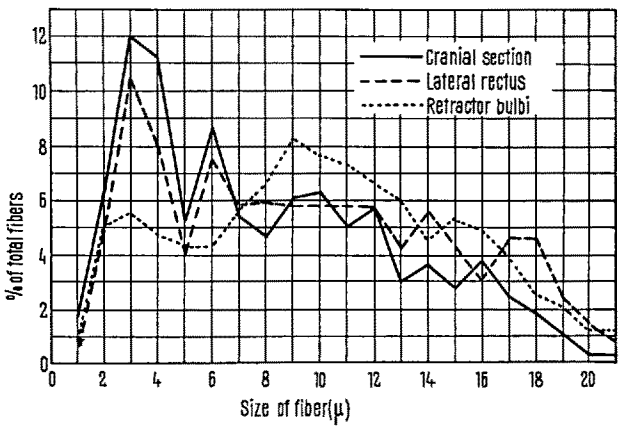

Fiber diameter in 1 μ size increments plotted as % of total number of fibers in the nerve. Each value is the average of measurements at that diameter in 4 nerves. Average range of variability at any fiber size was 4.89% for the retractor bulbi, 5.68% for the lateral rectus, and 2.18% for the cranial sections. Statistical evaluation courtesy of Dr. J. HARRISON.

Total fiber count of 4 VI nerve preparations

Nerve	Cranial		Lateral rectus		Retractor bulbi	
	Total fiber count	Thinly myelinated	Total fiber count	Thinly myelinated	Total fiber count	Thinly myelinated
1	1840	432	2074	425	308	27
2	1610	375	2035	370	190	16
3	1590	250	1704	240	320	12
4	1456	–	1629	–	201	–

Fiber counts of 4 nerves at the 3 areas of section. Thinly myelinated figures were not determined for nerve No. 4 because of poor photographic clarity.

naked axon to myelin sheath was determined to be 3.1:1 (S.D. ± 0.58) for the thickly myelinated fibers, and 8.1:1 (S.D. ± 0.49) for the thinly myelinated fibers. The proportion of thinly myelinated fibers in the total population of cranial fibers was 16–23%, and, in the branch to the lateral rectus, 14–20%. In contrast, the proportion in the branch to the retractor bulbi was 4–8% of the total population. The average of 30% increase in fiber number from nerve trunk to branches is seen predominantly in the thickly myelinated fibers and does not occur to any appreciable extent in the thinly myelinated fibers (Table).

By weight, the superior lateral slip constituted an average of 25% of the total muscle. To determine the innervation ratio to the retractor bulbi, ALVARADO's count of 3118 muscle fibers at the midregion of the muscle in 1 superior lateral slip was utilized. Assuming this represents 25% of the fibers, one can estimate that the 4 slips of the retractor bulbi muscle contain approximately 12,472 muscle fibers. The average nerve fiber count of the VI branch to the retractor bulbi was 255 (Table). From these figures an approximate innervation ratio of 1:50 can be estimated for the retractor bulbi[5].

Zusammenfassung. Das Faserspektrum des VI Hirnnerven der Katze wurde an 3 Stellen bestimmt: Austrittsstelle aus dem Pons, Verzweigungsstelle zum M. rectus lateralis und zum M. retractor bulbi. Wenigstens 3 verschiedene Typen motorischer Fasern wurden ermittelt: 1. grosse, dick myelinisierte, 2. kleine, dünn myelinisierte, 3. kleine, dick myelinisierte. Die Verzweigungsstelle zum M. retractor bulbi besteht hauptsächlich aus dem 1. Fasertyp.

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The Mode of Formation of Intracytoplasmic Structures in Tumours Induced by Viruses of the Avian Sarcoma Leucosis Group*

In the cytoplasm of avian tumours produced by the viruses of the avian sarcoma leucosis group, structures are sometimes electron-optically observed whose development and relation to the tumour growth and virus multiplication is unknown. Morphologically these aggregates of varying size, in which ribosome-like particles are arranged in a more or less homogeneous matrix with both components often showing the development of spheres or incomplete spheres. Furthermore, these formations contain virus nucleoid-like corpuscles[1–4].

The following considerations render it very probable that these aggregates are antigen-antibody precipitates of the living cells. The size and the localization of the spatial arrangement is ambiguous. The sphere formation of antigen-antibody complexes has been electron-optically described by models[5]. The ribosome aggregates often described as viroplasm can be especially observed close to the cell membrane and often without simultaneous indications of virus production by budding. As in the formation of secondary lysosomes the smaller immune precipitates are contracted to several larger ones[6]. Whereby the mass is not enclosed by a membrane; a sign that

* This paper is dedicated to Prof. H. LETTRÉ on the occasion of his 60th birthday.

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