webe besteht neben spärlichen, dünnen kollagenen Fibrillen, die meist in kleinen Bündeln auftreten, in der Hauptsache aus einer feinnetzigen, locker angeordneten und oft kontrastarmen Struktur (Figur 2). Die hier liegenden Fibrozyten und Histiozyten sind grosse, flach ausgebreitete Zellen mit langen, oft verzweigten Fortsätzen. Diese Fortsätze reichen manchmal bis an die Basalmembran des Endothels, wo sie sich füsschenartig verbreitern, aber doch von der Lamina densa der Basalmembran durch einen osmiophoben Spalt getrennt bleiben. Diesem subendothelialen lockeren Bindegewebsraum wird eine grosse Bedeutung für die Phagocytose giftiger und nicht giftiger Stoffe sowie für die Möglichkeit einer Reparation nach Entzündungen im jugendlichem Alter beigemessen.

Die eigentliche Fibrosa der Klappen, die besonders in der Mitralis kräftig ausgebildet ist, besteht aus dicht gefügten Bündeln kollagener Fibrillen. Auf Dünnschnitten werden diese Bündel sowohl in der Längsrichtung als auch quer und schräg getroffen. Die Fibrillen zeigen die typische Querstreifung mit einer Periodik von 600 Å und sind im Mittel 300 Å dick.

Ein ausführlicher Bericht, auch über die Klappen des rechten Herzens, folgt in der Zeitschrift für Zellforschung[8].

Summary. The heart valves of the rabbit were examined by electronmicroscope. The endothelium consists of a single layer of flat cells. Adjacent cells may overlap over extensive areas. The endothelial cells contain numerous tonofilaments. This structure is functionally and dynamically interpreted. The subendothelial connective tissue is called spongiosa. The fibrosa consists of bundles of collagenous fibres.

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Relationship of the Mesencephalic Trigeminal Cells to Jaw Muscle Proprioception in Birds

Afferent discharges in response to stretch of jaw muscles were found in the mesencephalon of mammals. Short latency sustained responses of the type produced by muscle spindles were recorded from cells of the mesencephalic nucleus of the fifth cranial nerve in response to stretching the jaw muscles in cats, dogs and goats[1–4].

No physiological investigations have been performed up to now in order to find the sites of activation by jaw movements in the brain stem of birds. The only available information is the observation by BORTOLAMI and VEGGETTI[5], who found degeneration of mesencephalic trigeminal cells located in the posterior commissure following section of the trigeminal mandibular branches to the masticatory muscles.

The present investigation is devoted to localizing the brain stem responses to jaw muscle movements in ducks.

More than 20 animals were employed. They were paralysed with 2–3 mg of Intocostrin Squibb and then maintained on artificial respiration. Under ether anaesthesia the animals were put in a stereotaxic apparatus. Following an appropriate craniotomy and removal of both occipital poles and of the anterior lobe of the cerebellum, the posterior commissure was exposed. The operatory wounds were infiltrated with some procaine and the ether anaesthesia was discontinued. Tungsten microelectrodes (dc resistance from 5 to 100 $M\,\Omega$) were introduced into the posterior commissure by means of a microcontrol. The microelectrodes were connected through a Grass Mod HIP 5A high impedance probe with conventional preamplifiers (Grass Mod P 5). The upper beam of a Cossor Mod 1049 Mk II oscilloscope and a loud-speaker monitored the inputs. The lower beam recorded the movements of the jaw and the stretches of the masticatory muscles by means of a Basile MDI 4 Microdynamometer. Films were taken by means of a Cossor type 1431 kymograph camera. The exact position of the recording microelectrode tip was ascertained in all the experiments by histological control.

The studied units were spontaneously active in many cases. The amplitude of spike potentials was of 150–200 microvolts. The following types of units were seen: (1) The great majority of the units (about 85%) were activated by opening the jaw (Figure). The response was characterized by a sustained increase in discharge rate accompanied sometimes by a recruitment of new units which were previously silent. The increase in discharge rate attained usually 250 pulses/sec. This type of unit was also

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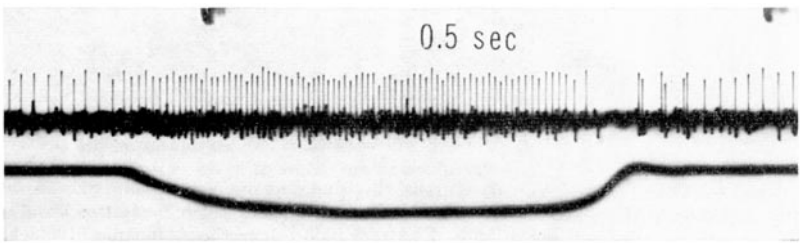

Upper beam: unitary discharge recorded from a trigeminal cell of posterior commissure. Lower beam: mechanogram of the jaw movement. The unitary discharge is activated by opening the jaw. Time: 0.5 sec.

activated by ipsilateral movements of the jaw without opening the jaw; only a few units were activated by contralateral movements of the jaw. (2) About 15% of the units were inhibited by opening the jaw. Such units exhibited a high discharge rate when the jaw was closed.

All the studied units showed a very modest adaptation. Rubbing the body feathers did not modify the electrical activity of the trigeminal cells of the posterior commissure which was also unaffected by stimulations of the other trigeminal receptors.

In several experiments some muscles of the jaw were gently isolated under ether anaesthesia before the curarization and then they were tested under stretch. The units which responded to the jaw opening were usually activated by ipsilateral stretch of the *adductor mandibulae externus superficialis* and *retractor anguli oris* muscles[6]. The responses of such muscles to moderate stretches exhibited a very short latency: 2–5 msec.

Electrical stimulation of the masticatory muscles during the activation of the unitary discharge provoked by opening the jaw was accompanied by an inhibition of such discharge, identifying the units as muscle spindle afferents.

Summing up, movements of the jaw and stretching of the jaw muscles provoked short latency sustained responses of the trigeminal cells of the posterior commissure on curarized ducks. Such responses were of the type induced by muscle spindles.

Riassunto. Nell'anitra curarizzata è stata registrata mediante microelettrodi di tungsteno la scarica unitaria di cellule trigeminali ubicate nella commessura posteriore. Questa viene modificata dai movimenti della mandibola e dallo stiramento di singoli muscoli che vi si inseriscono. Dette risposte sono del tipo di quelle indotte dai fusi neuromuscolari.

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Hepatic Parenchymal Cell and Nuclear Volume in Hypophysectomized Toad (*Bufo melanostictus*)

Deb, Boral, and Sarkar[1] and Deb and Boral[2] have recently measured the hepatic parenchymal cell and nuclear volume in the non-hibernating and hibernating toad respectively. Some hormonal influences over cellular proliferation and mitotic activity have been extensively studied by Leblond and Carriere[3] and Distefano and Diermeier[4]. The effect of hypophysectomy over the hepatic nuclear volume in rats has been shown by Lison and Valeri[5]. In the present investigation the hepatic cellular and nuclear volumes in hypophysectomized toad (*Bufo melanostictus*) have been presented and compared to that already reported in the non-hibernating toad.

Male toads of average weight 50–60 g were collected in the wild during their non-hibernating season. Some of the collected animals were hypophysectomized and were kept in this condition for 8 days in the presence of water only. Complete ablation of hypophysis was examined under the microscope. Incompletely ablated animals were discarded. The hypophysectomized toad could survive no more than 10 days, so the experiments were performed after 8 days. Volume of cell and nucleus was measured in exactly the same way as described in a previous paper by the same authors[1].

It can be observed from the accompanying Table that the volume of hepatic cell and nucleus was significantly reduced in comparison with the non-hibernating ones, both values being statistically significant at the 0.1% level.

From the results presented in the current experiment, it can be concluded that the cellular and nuclear volumes in the liver of hypophysectomized toads are smaller in comparison with the non-hibernating ones. Since McKellar[6] and Tier and Ravanti[7] have shown that the mitotic

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Cellular and nuclear volume in hypophysectomized and non-hibernating toad (*Bufo melanostictus*)

	Hypophysectomy (10)	Non-hibernation (10)	Difference of mean ± S.E.[a]	t
Cell volume – μ^3	589.64 ± 27.8	1377.24 ± 36.84	787.60 ± 46.1	17[b]
Nuclear volume – μ^3	154.94 ± 8.1	231.08 ± 6.44	76.14 ± 10.3	7.4[b]

Results of cell and nuclear volume of non-hibernating toad are taken from a previous paper by the authors[1]. The cipher in parentheses indicates the number of animals.

[a] Individual mean ± S.E. [b] Highly significant.