the intensity of fluorescence of the tissues after nerve stimulation and flow-stop was obviously much greater than that produced by threshold concentrations of NE, we have to conclude that NE concentrations of several orders higher must have been present in the immediate vicinity of these smooth muscle cells and elastic tissue to make them brightly fluoresce. This would mean that even higher concentrations would be found in the immediate vicinity of the nerve ending after nerve stimulation. Even though flow was stopped during stimulation, some limited local diffusion down the steep concentration gradient, and hence dilution, must have occurred by the time the transmitter reached the smooth muscle cells. It is therefore conceivable that concentrations of NE greater than 10^{-5} g/ml may be found around the nerve terminals soon after stimulation.

Résumé. Le développement de fluorescence diffuse provoquée dans les cellules lisses, les trabécules et le tissue élastique par la stimulation des nerfs spléniques du chat pendant l'occlusion, est tenu pour évidence directe de la libération de noradrénaline provenant de nerfs sympathiques.

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Dentatectomy: Absence of Effects on Dyskinesias Arizing from Chemical Stimulation of the Striatum in Rats[1]

A useful experimental model of dyskinesias arizing from an induced excitatory-inhibitory imbalance in the striatum has been developed[2]. This model was used in the present report to evaluate the effects of dentatectomy on dyskinesias of striatal origin in awake and freely moving rats. The study was prompted by recent attempts to produce relief of parkinsonian dyskinesias by dentatectomy[3,4] and related attempts to alter lesion-induced tremors in monkeys[4]. In addition, COOPER[5] has suggested that the cerebellum plays an important role in the production of parkinsonian and related postural tremors.

Materials and methods. Stainless steel cannulae were permanently implanted in the neostriatum (nucleus caudatus-putamen) of young adult male Holtzman rats (250–300 g body wt.) according to the prodecure of DILL et al.[2]. The cannulae were placed stereotaxically at the level of the anterior commissure with coordinates obtained from the atlas of the rat brain, by PELLEGRINO and CUSHMAN[6]. Seven days after cannulation, each rat was injected intrastriatally (IS) with 1.5 µg of carbachol (Carcholine), 0.5 mg/ml saline. IS-injections were made at a rate of 1 µl/min to a total of 3 µl. The details of the injection technique were described previously by DILL et al. in 1966[2].

The dyskinesias resulting from the IS injection of carbachol were ranked according to the following system: The frequency of the contralateral forelimb tremor was measured by means of a magnetic tremor recorder[7]. Latency of effect was expressed as the time interval between initiation of the IS injection and the first appearance of tremor.

Two days after the initial carbachol injection, each rat was lesioned stereotaxically in the dentate nucleus[6] by means of a LM-4 Grass lesion maker. Three groups of 5 to 7 rats were lesioned in the dentate nucleus according to the following plan: Group 1, ipsilateral to the cannula site; Group 2, contralateral to the cannula site; and Group 3, bilaterally.

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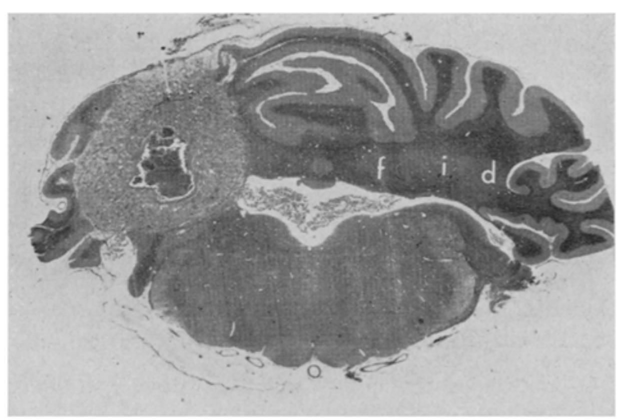
Type of dyskinesia	Rank of dyskinesia						
	0	1	2	3	4	5	6
Contralateral forelimb tremor		a	b	b	c	c	c
Facial tremor			a	a	b	c	c
Chewing motions			a	a	b	c	c
Neck tremor				a	a	b	c
Contralateral hindlimb tremor				a	b	b	b
Hyperextension of trunk					a	b	b
Bilateral forelimb tremor					a	b	b
Sialorrhea						a	b
Generalized convulsions							a

[a] Slight intensity and brief duration (1–5 min). [b] Moderate intensity and duration (6–40 min). [c] Severe intensity and long duration (more than 40 min).



Large unilateral lesion of rat cerebellar deep nuclei on left. Intact nuclei labeled on right: f, fastigial nucleus; i, interposed nucleus; d, dentate nucleus. ×7.

Effects of dentatectomy on dyskinesias induced by intrastriatal injection of 1.5 µg of carbachol in rats

Site of dentatectomy with respect to IS injection	No. rats	Dyskinesia rank Mean ± S.E.	Tremor frequency (c/sec) Mean ± S.E.	Latency (min) Mean ± S.E.	Duration (min) Mean ± S.E.
Contralateral					
Prelesion	7	3.57 ± 0.22	10.1 ± 0.15	2.03 ± 0.32	41.8 ± 7.64
Postlesion	7	3.28 ± 0.46	10.0 ± 0.48	2.11 ± 0.36	34.8 ± 6.76
Epsilateral					
Prelesion	5	3.0 ± 0.0	10.0 ± 0.0	1.5 ± 0.38	36.6 ± 6.04
Postlesion	5	3.2 ± 0.22	9.4 ± 2.18	3.5 ± 1.38	29.2 ± 7.70
Bilateral					
Prelesion	5	2.5 ± 0.46	8.80 ± 0.50	4.2 ± 1.4	30.4 ± 7.88
Postlesion	5	2.5 ± 0.46	8.82 ± 0.45	4.0 ± 0.56	22.8 ± 3.79

There was no significant difference between any pair of data by the student's *t*-test.

One week after the lesions were made in the dentate nucleus, each rat was reinjected IS with the same level of carbachol and the resulting dyskinesias ranked as before. The tremor frequency, latency, duration and rank of dyskinesia produced in each rat before and after dentatectomy were compared statistically by the method of student's *t*-test. Each rat was sacrified at the end of the study, the brain removed and examined microscopically for verification of the cannula and lesion placement.

Results and discussion. The results of this study clearly demonstrate that dentatectomy has little effect on dyskinesias arizing from cholinergic stimulation of the neostriatum of rats (Table). There was no effect by any of the 3 types of dentatectomy on intensity, character, latency, or duration of the dyskinesia. Since GOODMAN and SIMPSON[8] have shown the rat cerebellum to have bilateral influence on limb movements, it could be expected that unilateral dentatectomy would be less effective in this animal than in higher mammals. However, bilateral lesions of the cerebellar deep nuclei were also without effect on the dyskinesias of this model.

Unilateral lesions of the cerebellar deep nuclei produced leaning of the animal to the contralateral side. This was accompanied by excessive flexion of the limbs on the contralateral side and excessive extension on the ipsilateral side. The animals recovered from these effects in 4 or 5 days. Bilateral lesions induced a temporaty bradykinesia lasting a similar length of time. Locomotion appeared grossly normal at the time carbachol was given IS for the evaluation of the postlesion response.

The cerebellar lesions varied from 1 to 3 mm in diameter centering on the dentate nucleus. The large lesions destroyed the major portion of the nucleus interpositus as well as the nucleus dentatus (Figure). The nucleus fastigii was spared in all animals. There was no correlation between the size of the cerebellar lesion and the response to cholinergic stimulation of the striatum.

Lesions placed in the ventrolateral nucleus of the thalamus have been used for the clinical treatment of parkinsonian dyskinesias[9,10] and tremors of cerebellar origin[11,12]. Since these lesions interrupt both dentatorubrothalamic fibers as well as pallidofugal fibers, a cerebellar factor could not be ruled out[5]. The data presented in this report show that the cerebellum of the rat has little influence on tremors arizing from disturbance of strial function.

Although these observations were made on an animal with a primitive cerebellum, it seems unlikely that the role of the rat cerebellum would differ markedly from that of higher mammals[13]. Consequently, in light of these observations and those relating parkinsonism to malfunction of the striatum[14,15], one must reconsider the postulate that the cerebellum plays a significant role in the production of tremor in patients with disease of the striatum.

Zusammenfassung. Elektrolytische, ipsilaterale, kontralaterale oder bilaterale Läsionen blieben in den tiefen Kernen des Cerebellums ohne Einfluss auf Intensität oder Charakter von Dyskinesien, welche durch Injektionen von 1,5 µg Carbachol in den Caudatum-Putamen-Komplex ungehindert beweglicher Ratten hervorgerufen wurden.

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Der Einfluß von Herzfrequenz und Länge der Gefäßstrecke auf das Zeitintervall zwischen R-Zacke des EKGs und dem Beginn pressorezeptorischer Entladungen des Karotissinus- und Aortennerven

Diskontinuierliche elektrische Reizung des Karotissinus- bzw. auch des Aortennerven ist, wie bereits mehrfach betont wurde, der kontinuierlichen Reizung beim «baropacing» vorzuziehen[1–6]. Ausgeprägtere Senkungsreaktionen des arteriellen Druckes bei geringerer Belastung des gereizten Nerven und erhöhter Stabilität des gesamten Regelsystems sind einige Vorteile dieser Reizform.

Sicherlich ist eine dem endogenen Rhythmus des Kreislaufsystems adäquate Reizanordnung einer willkürlichen zeitlichen Verteilung der Impulsserien überlegen.