

reported in the Table), the simple laparotomy induced a decrease of 14.3% in the weight of preputial glands.

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Zusammenfassung

An weiblichen intakten, adrenal- oder ovariectomierten und sowohl adrenal-, als auch ovariectomierten Ratten wurden 2 h nach Injektion von 5-Hydroxytryptamin die Gewichtsveränderungen und der Ascorbinsäuregehalt der Nebennieren und der Präputialdrüsen untersucht. Eine Abnahme des Ascorbinsäuregehaltes der Nebennieren und der Präputialdrüsen wurde festgestellt und eine Gewichtszunahme der Präputialdrüsen selber beobachtet. Die Ergebnisse stimmen mit den bekannten Befunden über eine ACTH-freisetzende Tätigkeit des 5-Hydroxytryptamins überein.

Identification of a Third Subdivision of the Dorsal Spino-Cerebellar Tract

Ascending tracts in the dorso-lateral funiculus (Flechsig's fasciculus) have been analyzed by recording the mass discharge from the dissected fasciculus and by intracellular recording from single fibres. Four types of ascending pathways have been differentiated¹.

A. Neurones monosynaptically activated by impulses in muscle spindle afferents (Ia and II).

B. Neurones monosynaptically activated by impulses in Golgi tendon organ afferents.

C. Neurones activated by impulses in group II and III muscle afferents, and also by impulses in skin and joint afferents. These excitatory actions are drawn from an extremely wide ipsilateral receptive field. On adequate stimulation, a discharge can be evoked by muscle stretch and also from large areas of skin (usually by pressure and pinching, but sometimes also by bending of hairs).

D. Neurones activated exclusively by ipsilateral low threshold cutaneous afferents from a very restricted receptive field, the discharge being adequately elicited by bending of hairs.

There was reason to assume that type A and B constitute the dorsal spino-cerebellar tract, because, on stimulation of group I muscle afferents, a potential can be recorded from the anterior cerebellar vermis, which corresponds to the discharge in these neurones¹. Stimulation of group II and III muscle afferents, on the other hand, did not evoke a potential change in the cerebellar cortex; hence it could not be assumed that the axons of type C terminated in the cerebellar cortex.

In the present experiments, a more direct approach has been used for identification of axons belonging to the dorsal spino-cerebellar tract by investigating whether they can be activated antidromically from the cerebellar cortex.

¹ Y. LAPORTE, A. LUNDBERG, and O. OSCARSSON, *Acta physiol. scand.* 36, 175, 187 (1956).—Y. LAPORTE and A. LUNDBERG, *Acta physiol. scand.* 36, 203 (1956).—A. LUNDBERG and O. OSCARSSON, *Acta physiol. scand.* 38, 53 (1956).—B. HOLMQVIST, A. LUNDBERG, and O. OSCARSSON, *Acta physiol. scand.* 38, 75 (1956).—O. OSCARSSON, *Arch. ital. Biol.* 96, 199 (1958).

Of 67 neurones belonging to type A and B, 50 could be activated antidromically from the anterior vermis. Those 17 axons which could not be activated antidromically may have terminated in the most rostral part of the vermis, not exposed for stimulation. None of 47 axons tested could be activated by stimulation of the dorso-lateral funiculus in the proximal L V segment, as would be expected since Clarke's column does not extend caudally below the L IV segment.

63 neurones belonging to type C were identified; 36 of them could be activated antidromically from the anterior cerebellar vermis. Stimulation of the dorso-lateral funiculus in upper L V failed to activate the axon of any type C neurone with connection to cerebellum. Hence it can be concluded that neurones of type C constitute a third subdivision of the dorsal spino-cerebellar tract.

However, it is noteworthy that the proportion of neurones not activated antidromically from the cerebellum is larger with type C than with A and B (43 resp. 25%). There is, indeed, evidence of another ascending system of type C because of 22 neurones, which could not be activated from cerebellum, 11 were activated on stimulation of the dorso-lateral funiculus in L V and consequently have their cell bodies below the caudal end of Clarke's column. No experiments have been made to find the termination of these axons.

None of the units of type D could be activated antidromically from the cerebellum, and with all of these neurones the axons could be stimulated in L V.

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Zusammenfassung

Aktionspotentiale einzelner Fasern des Funiculus dorso-lateralis des Rückenmarks wurden registriert und dabei nach Axonen gesucht, die antidrom von der Kleinhirnrinde erregt werden konnten. Es gelang die Identifizierung einer dritten Unterabteilung der dorsalen spino-cerebellaren Bahn. Diese Neurone werden sowohl durch Muskelafferente der Gruppen II und III als auch durch Haut- und Gelenkafferente erregt. Zwei andere aufsteigende Bahnen, deren Zellkörper unterhalb des caudalen Endes der Clarkschen Säule liegen und deren Axonen sich in dem Funiculus dorsolateralis befinden, erreichen die Kleinhirnrinde nicht.

The Relationship Between the Flexion Reflex and Certain Ascending Spinal Pathways

In spinal cats, impulses in group II and III muscle afferents, in skin and in high threshold joint afferents give rise to the flexion reflex with excitation to flexor and inhibition to extensor motoneurons¹. In decerebrate cats, these actions are markedly depressed or even absent because the interneurons mediating them are tonically inhibited from suprasegmental centres².

¹ D. P. C. LLOYD, *J. Neurophysiol.* 6, 293 (1943).—L. G. BROCK, J. C. ECCLES, and W. RALL, *Proc. Roy. Soc. London (B)* 138, 453 (1951).—R. M. ECCLES and A. LUNDBERG, to be published.

² R. M. ECCLES and A. LUNDBERG, *Exper.* 14, 197 (1958).