corticostriate pathway (Kocsis, Sugimori & Kitai, 1977) is monosynaptically connected to striatonigral neurones.

Neurones projecting from the substantia nigra pars reticulata to the ventromedial nucleus of the thalamus had long, aspiny dendrites. Following a kainic acid-induced lesion in the ipsilateral striatum, degenerating boutons forming symmetrical synapses were found mainly along distal segments of dendrites of these nigrothalamic neurones. Thus, one of the striatonigral pathways makes monosynaptic contact with neurones of the nigrothalamic pathway, as suggested from electrophysiological studies (Deniau, Feger & Le Guyader, 1976).

This work was supported by the Wellcome Trust.

REFERENCES


An interneurone making synapses specifically on the axon initial segment of pyramidal cells in the cerebral cortex of the cat

By P. Somogyi.

1st Department of Anatomy, Semmelweis University Medical School, Budapest, Hungary and University Department of Pharmacology, Oxford

Golgi impregnated, light-microscopically identified interneurones were studied electron microscopically for their post-synaptic targets. One of them, named the ‘axo-axonic’ cell (AAC) was found to make symmetrical synapses so far exclusively with the axon initial segment (AIS) of pyramidal cells through its specialized vertical bouton rows. AACs have been found in the rat (Somogyi, 1977) and cat striate and peristriate cortex, in the macaque monkey striate cortex and in the kitten striate and motor cortex. One AAC terminates on several hundred pyramidal cells establishing 2–14 synapses on each AIS. Several AACs converge on to one pyramidal cell. Horseradish peroxidase was injected into visual cortex of rats. Retrogradely labelled pyramidal cells in the contralateral peristriate cortex were found to receive input from the AACs.

On the basis of structural features it is suggested that AACs might be inhibitory. They are identical with the ‘chandelier’ cells (Szentágothai & Arbib, 1974) previously thought to terminate on apical dendrites. Since the AIS is responsible for the generation of the propagated action potential, AACs would have a profound effect on the firing of pyramidal cells. They may provide the structural basis for some of the inhibition in the cortex and/or may synchronize the firing of pyramidal cells.

This work was supported by the Wellcome Trust.

REFERENCES

Lability of granular vesicles in Merkel cells of the type I slowly-adapting cutaneous receptors of the cat

By Ashima Anand, A. Iggo and A. S. Paintal. ICMR Centre for Respiratory Physiology, Vallabhbhai Patel Chest Institute, Delhi University, and the Department of Veterinary Physiology, University of Edinburgh.

The Type I slowly adapting receptor of the skin has a specialized cell closely associated with the nerve terminal (generator region). The tactile cell contains many dense-cored osmiophilic granules in the region of the cell apposed to the nerve plates and adjacent to synaptic-like junctions (Iggo & Muir, 1969). Their involvement in transduction was examined by testing the effects of extreme hypoxia on their number and distribution and the responses of receptors to standard mechanical stimuli in cats anaesthetized with sodium pentobarbitone and paralysed with Flaxedil. The cats were killed by ventilating them with 99·9% N₂ which caused the arterial \( P_{O_2} \) to fall rapidly to or near zero mmHg. Simultaneously, nitrogen at 3 L/min was made to flow through a plastic sock encasing the leg to prevent oxygen diffusion through the skin to the receptor and its nerve fibre in the skin, and the associated rapid recovery of an exhausted receptor. The central part of the saphenous nerve (from which fila-