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Effects of 5-Hydroxytryptamine and Related Substances on Electrical Activity of Hippocampal Neurones.

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Potentials evoked in the hippocampus by stimulation of the alveus and fornix were recorded. Cranial surgery and cannulation of trachea, femoral vein and lingual artery were performed under ether. The preparation was paralyzed with decamethonium and artificially respired. Wound margins were infiltrated with procaine. The hippocampus was exposed by suction decortication and protected with warm mineral oil. Bipolar stimulating electrodes delivered a rectangular pulse every 16 seconds to the alveus. Glass microelectrodes filled with 4M-NaCl were mounted in a micromanipulator and microscopically directed to the recording site in the proximity of hippocampal pyramidal neurones.

The actions of 5-hydroxytryptamine (5-HT), 5-hydroxytryptophan (5-HTP) and lysergic acid diethylamide (LSD) administered intralingually were examined, since the hippocampus has high concentration of 5-HT[1]. 5-HT (100 μg) produced decreased amplitude of the evoked response within 10 sec; recovery occurred in 2 min. Larger doses (200—500 μg) further depressed the amplitude of the potential and increased its duration and latency; complete recovery occurred in 15 min. Electrophoretic application of 5-HT via a second microelectrode caused immediate depression of the neuronal response followed by recovery in 3 min. 5-HTP was only onefifth as potent as 5-HT in depressing the amplitude of the action potential but its duration of action was prolonged up to 30 min. LSD (100 μg) caused total and long lasting depression of the evoked response. The drug effects reported are consistent with their effects on neurones in the lateral geniculate body, brain stem and visual cortex.

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1. BOGDANSKI et al. (1957), *J. Neurochem.* 1, 272.