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Integration of Cutaneous and Auditory Sensibilities in the Inferior Colliculus.

BERRY CAMPBELL. (Introduced by A. T. Rasmussen.)

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The intimate relation of the spino-thalamic tract to the inferior colliculus has been shown by Rasmussen and Peyton.¹ The following study was an attempt to determine whether a special integrative function was subserved by the long spinal fibers which enter the inferior colliculus. This was carried out with micro-

electrodes and the cathode-ray oscillograph. Cats and rats were used as experimental animals, Nembutal the anesthetic. For auditory stimulation, single condenser discharges were led through a piezo crystal. The nerves were stimulated by means of condenser discharge. The micro-electrodes were made by grinding sewing needles down to fine caliber and insulating them with enamel.

Contralateral clicks produce a potential in

¹ Rasmussen, A. T., and Peyton, W. T., *Surg.*, 1941, **10**, 699.

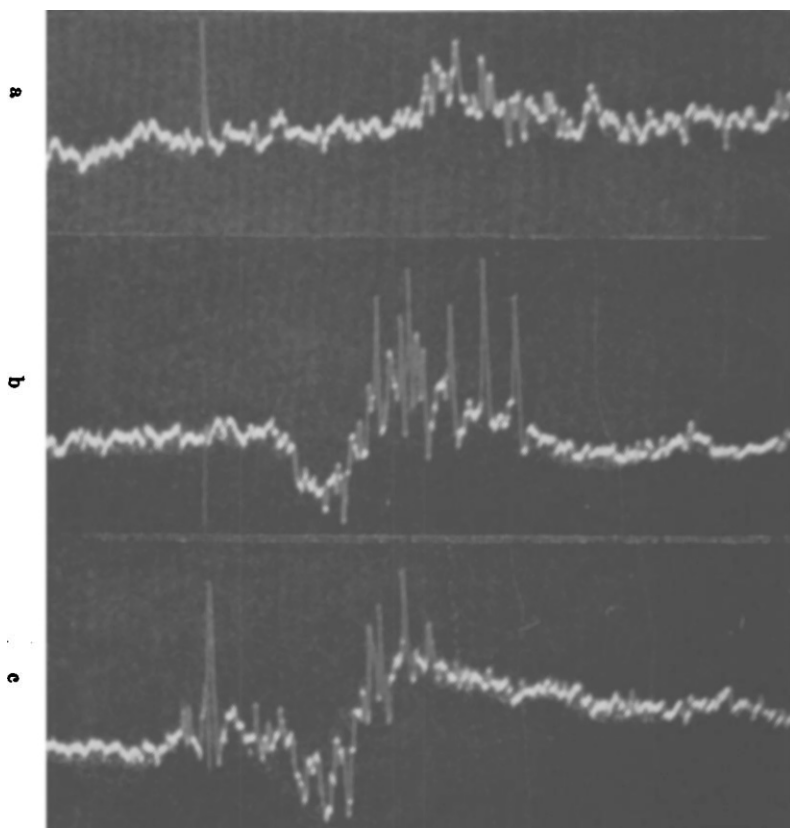


FIG. 1.

Micro-electrode recordings from inferior colliculus of cat (5-1-42). (a) response to stimulation of contralateral saphenous nerve. (b) To click in opposite ear. (c) To click in opposite ear which has been preceded by a shock to the saphenous nerve. The shock artefact of the conditioning stimulus is off of the record to the left. Time in milliseconds.

the inferior colliculus which, recorded with a single active micro-electrode, show a slow positive deflection followed by a longer negative one. Spikes, indicating the activity of single cells near the tip of the micro-electrode appear as the potential goes from positive to negative. The overall length of the potential is about 20 milliseconds.

The inferior colliculus will also respond to stimulation of contralateral cutaneous nerves. Those tested were the great auricular, median, ulnar, saphenous, tibial. The nerve to the semimembranosus failed to evoke a response in this region. Apparently the whole nucleus of the inferior colliculus was involved in these responses, but the records were easier to secure and showed more extensive firing of cells in the lateral portion of the nucleus. Instead of showing the characteristic positive-negative succession of deflections, the potentials evoked by stimulation of spinal nerves usually were characterized by a spikiness of the line, all discrete spikes being (as in the auditory potentials) negative. (Fig. 1, b). The earliest activity recorded following stimulation of the forelimb nerves in the cat was observed at

4 milliseconds, and following hindlimb stimulation 8 milliseconds.

When the spinal nerve stimulation was used to condition the auditory potential by placing it about 12 milliseconds ahead of the latter, 2 effects were noted. The first was a decrease in the duration of the spiking component of the auditory potential. This is due to the shortening of the train of spikes in the individual units (Fig. 1, c). The second effect of the conditioning is the decrease in the number of units involved in the auditory potential. Detailed analyses of the potentials of the inferior colliculus will be published elsewhere.

Summary. Stimulation of cutaneous nerves and of the cochlea evokes characteristic potentials in the inferior colliculus. With micro-electrode recording, the activity of individual cells may be observed. Placing the cutaneous stimulation before the auditory stimulation demonstrates a conditioning of the auditory potential which decreases the number of cells fired and shortens the train of impulses from those cells left active.

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Ultraviolet Absorption Spectrum of Human Seminal Plasma.*

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Although ultraviolet absorption spectra of several body fluids have been published, we have found none of seminal plasma. Accordingly, during the course of electrophoretic and chemical examination of human seminal plasma, the following measurements of such absorption spectra were made and some factors affecting these spectra were studied.

Methods and Observations. The spectra were measured with a Hilger quartz spectro-scope No. E-316 equipped with a Spekker

photometer and with a hydrogen discharge tube designed by Darby.¹ Details of curve structure were not sought, principal interest being in the positions of maxima and minima and in shifts resulting from changes in pH values of the solutions.

Semen was centrifuged and the plasma dialyzed at 3°-5° in viscose casing against 0.02 M phosphate buffer containing 0.055 M NaCl (pH 7.85) and diluted for spectroscopic

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¹ Darby, Hugh H., *J. Am. Chem. Soc.*, 1940, **62**, 1874.

² Ross, V., Moore, D. H., and Miller, E. G., Jr., *J. Biol. Chem.*, 1942, **144**, 667.