12061 P

Activity in the Optic System Following Stimulation by Brief Flashes of Light.*

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Details of the response of the optic nerve of the rabbit to stimulation by short light flashes, described in a previous paper, are also exhibited in the cat. The most obvious difference is that the cat record is less diagrammatic, more confused by apparently random activity. The cat retina is considerably the more sensitive as measured by the size of nerve responses to weak illumination. Immediate and delayed "on" responses are recognizable, each involving repetitive firing to the shortest stimuli. A distinct "off" response is produced by a flash of 50 msec, similar in form to the first "on". With much shorter flashes, an "off" response can be recognized superposed upon the second "on" discharge.

Records from the cortex and superior colliculus following flash stimulation of the retina have been correlated with the nerve response. The successive spikes of the nerve response, occurring at 100 per sec with strong light, show facilitation at the geniculate level, and the first few can be correlated with specific spike-like elevations in the cortical or colliculus record. When the first spike of the nerve record is the highest, the second spike in the cortical record may be higher than the first, presumably due to temporal summation within the 20msec period in which such summation occurs at the geniculate level after electrical shocks. The 3 nerve bursts, 2 "on" and one "off", are duplicated at the higher levels after suitable duration of flash.

In the cat, the major response of the colliculus following electrical shocks to the nerve is a slow wave activated by the highest-threshold fibers, in contrast to the cortex which is activated almost exclusively by the lowest-threshold units. The colliculus of the rabbit shows 2 successive elevations, one due to low-threshold and one to high-threshold fibers. In both animals these waves, which are post-synaptic, reverse in sign as a recording electrode passes from the surface of the colliculus downward, at about the level of the stratum

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opticum. In the rabbit the 2 elevations present reverse at slightly different levels. This enables one so to place an electrode that to electrical stimulation these elevations are of opposite polarity.

An electrode thrust into the optic nerve back of the eyeball may be employed for electrical stimulation and recording, without serious interference with retinal stimulation by light. At a position of the recording electrode in the colliculus where the 2 elevations are of opposite sign with electrical stimulation, there also occur elevations of opposite sign after strong light flashes, enabling one to identify indirectly the firing of the different groups of fibers in the nerve activated *via* the retina. As the flash becomes weaker, the large-fiber response decreases before the small-fiber wave is materially affected. A specific interpretation of this and similar events is postponed until certain other characteristics of records obtained from the colliculus are better understood, but the prospect is that events in the retina and in the central nervous system may be correlated through the common denominator of fiber size, as detected by threshold to electrical stimulation.

12062 P

Reduction of Blood CO after X-ray Treatment.*

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Rapid recovery of rats[1] and monkeys[2] from severe CO effects when they were exposed to relatively small amounts of X-rays, has been previously reported. The X-rayed animals were restored to normal within a few minutes while their controls either died without regaining consciousness or exhibited a slow and laborious recovery.

This report presents the actual CO content of the blood of the treated pairs of rats in a new series of experiments. Albino rats of the Wistar stock were paired to give like ages and weights. Only male rats were employed but previous work has indicated no difference between the sexes in response to X-ray after CO.

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1 Cameron, John A., PROC. SOC. EXP. BIOL. AND MED., 1939, **42**, 29.

2 Cameron, John A., *Radiology*, 1941, in press.