to discover any constant or close relation between learning and activity. It must be concluded, therefore, that even so simple a problem as the learning of this maze is a test, however crude, of intelligence rather than an indirect means of estimating activity. The expenses of this investigation were in part defrayed by a grant from the Sage Research Foundation.

61 (2293)

The possible influence of fatigue on the reaction time of thyroidectomized sheep.

By HOWARD S. LIDDELL (by invitation).

[*From the Department of Physiology, Medical College, Cornell University, Ithaca, N. Y.*]

The time required by a sheep to escape from a simple maze which it has previously learned has been taken as a measure of its reaction to environmental change. It was found that a thyroidectomized sheep exhibits a greater reaction time than does its normal twin when it runs a simple maze in which the position of the cul de sac is reversed at every trial and four successive trials per day are given.[1] These preliminary results were obtained with a maze sixty feet in length. The greater time required by the cretin sheep was largely due to frequent pauses but also to its sluggish progression through the maze. It was suspected that muscular fatigue might be a factor of importance in accounting for the difference in reaction time between the normal and cretin sheep. In order to eliminate this possibility by reducing locomotion to a minimum a system of three gates was constructed whereby the same maze could be shortened until the distance from the starting box to feeding compartment was reduced to six feet.

The twin sheep, above referred to, were caused to learn the same alternation problem in this short maze that they had previously learned in the long maze. In this case, also, the cretin required a greater time than its normal twin to escape from the labyrinth. The difference between the normal and thyroid-

[1] Liddell, H. S., *Proc. XI Int. Physiol. Congress*, Edinburgh, July, 1923.

ectomized animals was largely due to pauses made by the cretin in choosing which way to turn after leaving the starting box. The experiments with the short maze have, thus far, verified the hypothesis previously advanced, viz.: that the greater time required by the cretin to escape from the maze is due to the lethargic functioning of the neural mechanism involved in avoiding the cul de sac when its position is changed at every trial. The expenses of this investigation were in part defrayed by a grant from the Heckscher Research Foundation.

ABSTRACT OF COMMUNICATIONS.

Minnesota Branch.

Thirteenth Meeting.

Minneapolis, Minnesota, November 15, 1923.

62 (2294)

Threshold densities of the electric current for inhibition and orientation of growth in Obelia.

By E. J. LUND.

[*From the Laboratory of General Physiology, University of Minnesota, Minneapolis, Minn.*]

If an electric current of proper density is passed lengthwise through an internode cut from the stem of the common hydroid *Obelia,* then the polyp on the end turned toward the cathode can be prevented from growing while a normal polyp will grow on the end turned toward the anode. The inhibition toward the cathode is reversible. The threshold density of electric current in the sea water for reversible inhibition on apical internodes is close to 66 microamperes per square millimeter of cross section. If an electric current of proper density is similarly passed through the internode at right angles to its long axis, then normal growth of a polyp occurs at each end, but the axis of symmetry in the regenerating tissue is deflected toward the anode. The magnitude of the angle of deflection depends in a certain definite quantitative manner upon the density of the electric current. The threshold density of the electric current in the sea water for a barely perceptible deflection of the growth