The cathodically galvanotropic orientation of nemerteans, *Lineus,* and the anodic orientation of the gephyrean *Echiurus,* are reversed by the action of strychnine under conditions such that the typical "reversal of inhibition," or reversal of reaction to tactile excitation, induced by this substance is apparent. Nicotine does not give this result. Since it is necessary to assume that the strychnine effect is due to action upon the central ganglia, and since the galvanotropic effect is supposed to depend upon action of the current on nerve cell bodies of the central ganglia, it must be assumed that the locus of reversal by strychnine is not perikaryial, but presumably synaptic.

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An Experimental Study of Mauthner's Cell in Amblystoma.*

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Anatomical descriptions of the connections of the two giant Mauthner neurones in the central nervous system of teleost fishes[1, 2] and amphibia[3] have strongly suggested a functional rôle in the equilibration of the organism during the performance of rapid and intricate movements.

The two perikarya lie in the medulla, at the level of entrance of the acoustic nerve roots. The axones decussate in the ventral commissure and course caudally through the spinal cord where synaptic connections are made with the motor horn cells. In addition to establishing a direct connection with the VIII root fibers, many additional dendritic connections have been described.[2, 3]

The nature of the synapse of this cell has been investigated by Bartelmez[2] and by Marui.[4] The latter author has also described certain effects of over-activity upon the morphological structure of the synapse.[5]

The developmental specificity of this cell became apparent during experiments in which the cephalic end of the spinal cord was replaced by an extraneous medulla. In some animals with two medullas in series, four Mauthner's cells with axones coursing through the cord have been noted.[6, 7]

The experiments briefly reported here deal with the elimination

* The effects of embryonic ear extirpations upon development of Mauthner's cell in Amblystoma have been studied by Doctor W. F. Greene in the Yale Zoölogical Laboratory. His results have not yet been published.

of one of the two neurones normally present, with a view to studying the effect of such absence upon the activity of the organism. One ear vesicle of embryos in the tail-bud stage of development was excised, thus exposing the medulla. A very small piece of the lateral wall of the medulla was then excised, after which an otic vesicle from another embryo was grafted (with normal orientation) into the excavated ear region. For comparison, other experiments were carried out in which the ear vesicle alone was removed. The behavior of larvae lacking one ear was found to be essentially similar to that described by Greene and Laurens.[8] The animals in which an attempt has been made to remove Mauthner's cell (26 cases), fell decidedly into two groups as regards behavior. In one group (group *A*) equilibratory disturbances were either slight or entirely absent but the animals exhibited 'jerky' swimming, they were rapidly exhausted and were unable to execute the normal sustained rapid swimming reflexes. In the other group (group *B*) the functional disturbances were essentially like those lacking an ear vesicle (bend of head towards operated side, body torsion, marked flexion of fore limb on operated side, and extension of opposite limb, emprosthotonus, 'corkscrew' swimming, coming to rest in almost any position, general inactivity and in some cases rapid exhaustion).

An examination of sections showed that in five cases belonging to behavior group *A*, Mauthner's fiber was absent, but that the ear and its nervous mechanism were normally developed. In behavior group *B*, regardless of whether Mauthner's fiber was present or absent, defective development of the ear and its nervous connections were observed. A correlative study of the structural and functional abnormalities for the groups as a whole shows that in the absence of one Mauthner's cell essentially normal posture is maintained. This suggests that unless other tracts are compensating for its loss, Mauthner's cell is not primarily bound up with the equilibratory reflexes. The type of response elicited by the lack of Mauthner's fiber, suggests that this giant neurone plays an important rôle in transmitting impulses which are concerned in sustained coördinated rapid reflexes.

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[3] Herrick, C. J., *J. Comp. Neurol.*, 1914, xxiv, 343.
[4] Marui, K., *J. Comp. Neurol*, 1918, xxx, 127.
[5] Marui, K., *J. Comp. Neurol.*, 1918, xxx, 253.
[6] Detwiler, S. R., *J. Exp. Zool.*, 1925, xli, 293.
[7] Unpublished results.
[8] Greene, W. F., and Laurens, H., *Am. J. Physiol*, 1923, lxiv, 120.