

The results are briefly these. The removal of the eye and the brain results in the formation across the gap of the wound of a curtain of tissue in all probability derived from the ependymal lining of the neural tube. The ingrowing fibers of the optic nerve from the left eye apparently stimulate the tissue thus formed to regenerate to a considerable extent. At the same time forward growing fibers from lower centers also afford some stimulus for regeneration, as was shown in the case of the primitive pallium of the telencephalon. The tissue thus regenerated is very similar in its organization to that normally found, except that important optic areas are lacking. An analysis of the fiber tracts involved must be deferred until later.

The removal of the mesencephalon leaving the eye in its normal position results in an almost complete regeneration of the optic lobes. In one larva only a very slight defect in the right mesencephalon distinguishes it from a normal unoperated individual. The process is apparently a much faster one than it is in the case of the olfactory system for the complete regeneration has occurred at the end of some three weeks, while in the case of the cerebral hemispheres complete regeneration did not occur until the end of as many months. This is really not so strange as would seem on the face of it, because, as the writer has shown elsewhere, the optic sense becomes functionally active some time before the olfactory. The early activity of the eye would then result in an early stimulus to regeneration.

These results show, as in the former experiments, that functional activity of the end-organ normally connected with the brain affords the necessary stimulus to regeneration of the part of the brain removed.

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Conduction, excitability and rhythm-forming power of the atrio-ventricular connection in the turtle.

By **HENRY LAURENS.**

[From the Osborn Zoölogical Laboratory, Yale University.]

As in the heart of the turtle *Clemmys luteola* and of the lizards *Lacerta viridis* and *agilis* (Laurens¹) the right and left parts of the

¹ Laurens, *Pflüger's Archiv*, 1913, 150, p. 139.

atrio-ventricular funnel of *Malacoclemmys geographica* are the portions which are most efficient in conducting the contracting impulse from the auricles to the ventricle. When the auricles are partially separated from the ventricle by a series of cuts leaving only a narrow connection, and in consequence of which atrio-ventricular block (complete or incomplete) has been brought about, it is these parts which are later most capable of conducting the impulse from the auricles to the ventricle so that the contractions of the latter follow those of the auricle coördinatedly, or so that the incomplete block is decreased.

Stimulating the funnel of beating (in situ and excised) and still hearts (first Stannius ligature) with single shocks (quick make and break) and with interrupted currents of short duration have shown (1) that the funnel is more easily excited than the base of the ventricle, (2) that the right and left parts of the funnel are more easily excited than other parts (dorsal and ventral) and (3) that the excitability of the funnel increases as one approaches the auricle.

The stimulation of the funnel just below the level of the A-V boundary of beating hearts with interrupted currents, even when these are strong and of long duration, can only occasionally produce a "fibrillation" of the ventricle or a V-A rhythm (funnel rhythm) which lasts over after the stimulation is discontinued. This is possible, however, and curves have been obtained from excised hearts showing a duration for several seconds of a funnel rhythm following a ventricular "fibrillation." In the still heart the setting up of a funnel rhythm is more easily and frequently accomplished, and several cases have been registered showing a funnel rhythm lasting for several minutes.

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The influence of the vagi and of the sympathetic nerves on the rhythm-forming power of the atrioventricular connection in the turtle.

By **HENRY LAURENS** and **C. C. GAULT.**

[*From the Osborn Zoölogical Laboratory, Yale University.*]

The investigations here reported were undertaken to determine the action of the vagus and sympathetic nerves upon the