

The Influence of Osmotic Pressure upon the Regeneration of *Gunda ulvæ*. By Dorothy Jordan Lloyd, B.Sc. (*Proc. Roy. Soc., B*, Vol. XXVII, 1914.)

THE animals used in the experiments recorded in this paper were collected from the shore near the borders of a small stream and between the tide-marks. They were therefore exposed in their natural habitat to a wide diurnal variation of osmotic pressure. Experiments made with whole animals showed that they are capable of living indefinitely in water having an osmotic pressure of more than two and less than thirty-three atmospheres. Experiments on the rate of regeneration of the posterior end only were considered. These showed that the rate of regeneration of the posterior end depends on the osmotic pressure of the medium. This has an optimum value at eighteen atmospheres, and limiting values at five and thirty-five atmospheres.

Restoration of the lost parts in *G. ulvæ* is brought about entirely by the undifferentiated parenchyma cells, which migrate to the region of the wound and form the new tissues. The growth of the new parts is always accompanied by reduction of the old ones. For values of the osmotic pressure lying between the optimum and the limiting values the migration of the parenchyma cells is retarded, and the rate of restoration is retarded to a similar degree. At the limiting values there is no migration and no restoration of lost parts.

G. ulvæ also shows the phenomena of reduction under conditions of starvation. These are (1) absorption of the genital system, (2) general reduction in size. Both of these changes are brought about by the phagocytic action of the parenchyma cells. During regeneration the same reduction processes occur as in starvation. When the restoration of lost parts is retarded, as happens on raising or lowering the osmotic pressure, reduction is retarded to the same extent.

In strongly hypotonic solutions the gut cells increase in size and become vacuolar; in strongly hypertonic solutions they diminish in size and become dense, showing that there has been actual gain or loss of water by the tissues.

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