

The diffusion of the liquids through the cell-wall into the plant tissue is a molecular phenomenon closely allied to solution and evaporation, and technically known as osmosis. Cover the large end of a thistle tube with a tightly stretched membrane such as ox-bladder, which has been soaked in water for a few minutes. Fill the bulb of the tube with a concentrated solution of sugar, and fasten upright in a cylinder of distilled water in such a position, that the surfaces of the liquids are level. Note the rise in the tube. When liquids of different densities are separated by a membrane, which they are capable of permeating, there is a tendency for them to equalize. Thus, in the case in hand, a large amount of water has been drawn in to dilute the sugar solution, while a small portion of the latter has passed out into the cylinder as can be ascertained by testing. The amounts conveyed in each case may be the same or they may vary widely for it has been found that the affinity, mobility and density of the liquids, and the nature of the membrane influence the relative exchanges.

The concentration of the cell-sap is only slight, and this explains why it is that plants can only make use of food in weak solutions. In strong solutions there would be an egress of water from the roots and the plants would collapse.

