COMPARATIVE PERMEABILITY OF LIVING CELLS TO CATIONS AND ANIONS[1]

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Experiments performed on *Amoeba proteus* and on *Rhizoclonium*, a fresh-water green alga, suggest that these cells are relatively impermeable to strong electrolytes as ion pairs. Impermeability of *Rhizoclonium* to anions is indicated by the fact that the cells fail to show deplasmolysis in hypertonic solutions of neutral salts as well as in NH_4Cl solutions, though they are readily deplasmolysed in hypertonic solutions of ammonium salts of fatty acids. In the case of Amoeba the data show that its plasma membrane is selectively permeable to cations and relatively impermeable to anions. This is suggested by the fact that the addition of inorganic acids to K or Na salt solutions prevents the decrease in protoplasmic viscosity and the inhibition of locomotion which ccurrs when the cells are immersed in neutral or alkaline solutions of these salts. The same acids also prevent the marked increase in viscosity produced by immersion in neutral or alkaline Ca salt solutions. Conversely, the addition of Na or K salts prevent the increase in viscosity produced by immersion of the cells in acid solutions of distilled water. Since these effects are a function of cations and not of anions, and since fatty acids (which penetrate the cells as molecules) can not antagonize their salts, it is concluded that these intereffects of acids and salts are produced by the exchange of cations for H^+ ions across an anion-impermeable membrane.