maximum concentration reached varied in different experiments, there was a clear tendency for it to decrease over the 6 days in culture. After 2 days in culture the maximal stimulation was approx. 50% of that at 1 h and had decreased to 20% by 6 days.

A concentration of approx. $0.05 \mu\text{M}$ -glucagon caused a half-maximal stimulation in liver cultured for 2 and 6 days, whereas a concentration of $0.6 \mu\text{M}$ was required to cause half-maximal stimulation in liver cultured for 1 h. The different sensitivities of liver cultured for 1 h, 2 days and 6 days and of the perfused liver (Exton *et al.*, 1971) or isolated liver membranes (Pohl *et al.*, 1971) may be due to slow diffusion or destruction of the hormone in this culture system.

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Permeability of Human Buccal Mucosa to an Amino Acid Analogue, the Antibiotic D-Cycloserine

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Absorption of organic amines and organic acids from the mouth has been reported. Such permeability was maximal at the pH value corresponding to the un-ionized form of the compound. Absorption was also proportional to the partition coefficient of the compound between a lipophilic solvent and water (reviewed by Beckett & Hossie, 1971).

D-Cycloserine (D-4-amino-3-isoxazolidone) is an antibiotic inhibiting the incorporation of D-alanine into bacterial cell walls (Strominger *et al.*, 1960). It has an amino group and a phenolic hydroxyl group giving an isoelectric pH (pI) of 5.9. Absorption from the mouth was measured as with other drugs (Beckett & Hossie, 1971), and D-cycloserine was determined colorimetrically (Jones, 1956).

Loss from the mouth was proportional to initial concentration at pH 5.9 over the range 1–5 mM with a 5 min test period. The linear transport kinetics excluded metabolism of the D-cycloserine by buccal mucosa accounting for its loss from the buccal cavity. This result suggested passive diffusion or, conversely, a carrier-mediated process with a very high affinity constant.

D-Cycloserine transfer at a concentration of 1 or 2 mM was not inhibited by equimolar L-serine, D-serine, L-alanine, D-alanine, β -alanine or L-methionine. These results are compatible with passive diffusion of the un-ionized molecule. This type of transport was also found for D-cycloserine with rat small intestine *in vitro* (Wass & Evered, 1971). Further, buccal transfer was not inhibited by the presence of a metabolic inhibitor, Amytal, at an equimolar concentration (2 mM).

Permeability of the human buccal mucosa to D-cycloserine was also shown by L-proline and L-cycloserine. The lack of stereospecificity is also compatible with passive diffusion.

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Micro Methods of Osmometry Based on the Equilibrium Swelling of Gels

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Edmond *et al.* (1968) and Ogston & Wells (1970) showed that the changes of diameter of a single bead of Sephadex can be used to measure colloid osmotic pressure in solutions of solutes that do not penetrate the gel. Because of its low sensitivity (about 1500 dyn/cm²), this method is not suitable for measuring low osmotic pressures, e.g. for measuring molecular weights of proteins. Also, Sephadex G-50 is too permeable to proteins of molecular weight less than 100 000.

Several-fold increase of sensitivity, accompanied by decreased permeability to solute, can be achieved by use of a thin (0.5 mm or less) strip of polyacrylamide gel, of length greater than the diameter of a Sephadex bead, and of concentration 18% (w/v) or higher.

A far greater increase of sensitivity is achieved by use of a thin layer of polyacrylamide gel cast on to a narrow strip of cellulose tissue, about 15 mm long. This curls into an almost closed loop, whose ends separate in proportion to the osmotic pressure of a solution of non-penetrating solute. Sensitivity of 20 dyn/cm² can be achieved, with impermeability to relatively small molecules. For example, the molecular weight of cytochrome c (12 384) measured in