of polysaccharide, which corresponds to 0.05 mgm. soluble starch contaminated in the lima bean enzyme used in the experiment of Fig. 1, will give an error of approximately 5 per cent in the determination of the K_s value; an error of this order is permissible in experiments of this nature.

Although I cannot account for the results obtained by Green and Stumpf, it can now be said that, without exception, phosphorylase requires an already existing polysaccharide primer in the synthesis of starch from glucose-1-phosphate.

Fig. 1. Effect of added primer on purified lima bean phosphorylase in the synthesis of starch from glucose-1-phosphate. The reaction mixture contained 1 ml. 0.5 M acetate buffer (pH 6.0), 0.5 ml. purified lima bean phosphorylase (prep. L.B.B.8; 1/20 diluted), 1 ml. 0.1 M glucose-1-phosphate, and various amounts of Lintner's soluble starch as indicated on the curves. Total volume, 3.5 ml. Incubation temperature, $37 \pm 0.1^\circ$. At intervals, samples were withdrawn from the digests, deproteinized with 5 per cent perchloric acid, and tested for inorganic phosphorus

Fig. 2. Effect of primer polysaccharide in purified lima bean phosphorylase. The standard digest (curve IV) contained 1 ml. 0.5 M acetate buffer (pH 6.0), purified potato phosphorylase, and 1 ml. 0.1 M glucose-1-phosphate. Other digests contained in addition: curve I, 25 mgm. Lintner's soluble starch; curve II, 0.5 ml. boiled lima bean enzyme (prep. L.B.B.8); curve III, 0.5 ml. boiled lima bean enzyme, treated with purified sweet potato β -amylase, and heat-inactivated. Total volume of each digest: 3.5 ml. Incubation temperature: $37 \pm 0.1^\circ$. At intervals samples were withdrawn, deproteinized with 5 per cent perchloric acid, and tested for inorganic phosphorus

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Experimental Dissociation of Cells from Chick Embryos

DURING the development of an embryo, a very important part is probably played by the forces of attachment between cells. Weiss¹ in particular has emphasized the importance of interactions between cell surfaces in the processes leading to tissue differentiation. Holtfreter^{2,3} has shown that the cells of the young amphibian embryo can be dissociated experimentally by alkali-treatment, and Mookerjee

*et al.*⁴ has made a comparative study of the firmness of cell-attachment both in different species of Urodele and during the course of differentiation of one particular organ, the notochord. A similar type of cell-dissociation has now been shown to occur in the chick embryo.

Whole embryos, or parts of them, at the primitive streak stage, are placed in chick Ringer solution the pH of which had been brought to 9.9-2. Within a few minutes the cells fall apart either singly or in small groups. The cells are at first rounded, but may later become elongated or flattened, with irregular outlines. An intake of water clearly occurs, and an ectoplasmic layer may be lifted off from the endoplasmic interior. The ectoplasm may assume the form of a lobular pseudopodium, which can appear at any point on the cell surface. With increasing imbibition of water the ectoplasm may be lifted away from the endoplasm over the whole surface of the cell. Churning movements are visible within the endoplasm. Over-exposure to alkaline media renders the cell surface so permeable that large visible particles may leak out through the membrane,

which eventually may take on a crenated appearance shortly before the death and complete disintegration of the cell. Except in the final stages, these cell changes are quickly reversible by alteration of the pH to the acid side. The general picture is thus extremely similar to that seen in the tissues of early amphibian embryos.

After the experiments reported here were concluded, Moscona and Moscona⁵ have published observations on the dissociation of tissues of later stages of the chick embryo.

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