



Fig. 2

glucose (= 100), are given in the accompanying table. The relative absorption rates, determined on 29 rats of the same stock, are included for comparison. Similar relative absorption rates are given in the literature^{1,7}. The technique of Cordier and Touzé⁶ was used to determine the absorption rates. It was found that a group of five rats would absorb 57 ± 5 mgm. glucose in 30 min. from 2 ml. of a 0.33 M (isotonic) solution injected into the small intestine. Other sugars were examined in the same way. The observed hexokinase activity was sufficient to account for the phosphorylation of at least 59 per cent of the glucose absorbed in 5 min.

	Relative Phosphorylation and Absorption Rates				
	Galactose	Glucose	Fructose	Mannose	Xylose
(a)	100	100	53	32	29
(b)	134	100	50	—	—
(c)	112	100	52	25	26

(a) Phosphorylation rates in water homogenates.
(b) Phosphorylation rates in Ringer homogenates.
(c) Absorption rates.

The accompanying diagrams show the effect of raising the sugar concentration upon the phosphorylation rates of the sugars. The 'dip' in the glucose concentration curve was observed in 22 out of 25 rats examined, and is flattened when the concentration of adenosinetriphosphate is raised. The phosphorylation-rates of the different sugars are found to vary with sugar concentration in much the same way as do their absorption rates¹.

The effect of variation in concentration of adenosinetriphosphate upon the rate of the hexokinase reaction depends upon the sugar concentration, and is different for different sugars. At a sugar concentration of 0.0055 M, the rate of the reaction with fructose remains constant over a concentration range of 0.013–0.04 M adenosinetriphosphate; but the rate with glucose varies with the concentration of adenosinetriphosphate. Meyerhof (*loc. cit.*) found brain homogenates to behave in a somewhat similar manner, alterations in the concentration of adenosinetriphosphate affecting the glycolysis rates with glucose and fructose differently, at the same sugar concentration.

Phosphatase activity was studied in a manner similar to that used for hexokinase, without adenosinetriphosphate, the appearance of free sugar in the digest being followed. Sugar is set free from glucose-6-phosphate and from fructose-6-phosphate at the same rate; at an ester concentration of 0.0055 M this is equivalent to 0.75 mgm. sugar appearing per millilitre homogenate in 5 min.

These observations suggest that hexokinase participates directly in sugar absorption, and with the phosphatase functions in a phosphorylation-dephosphorylation cycle. The absorption rates of different sugars are determined by the behaviour of the hexokinase, which may, in its turn, be influenced by the amount of adenosinetriphosphate available *in vivo*.

These results will be reported in detail elsewhere.

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⁵ Meyerhof, O., and Gellazkova, N., *Arch. Biochem.*, **12**, 405 (1947).

⁶ Cordier, D., and Touzé, M., *C.R. Soc. Biol.*, **142**, 91 (1948).

⁷ Westenbrink, H. G. K., *Arch. Néerl. Physiol.*, **21**, 433 (1936).

Bacteriostatic Substances in the Unsaponifiable Fraction of Cod-liver Oil

WE have investigated the unsaponifiable fraction of cod-liver oil and found that it has a strong bacteriostatic effect; especially interesting is the fact that *in vitro* it suppresses growth of *M. tuberculosis*. The non-saponifiable matter was chromatographed over alumina, the fraction most firmly held having the strongest activity. This fraction was a viscous oil and did not contain sterols, vitamin A or vitamin D. Only hydroxylic compounds (probably chiefly unsaturated) were present, and among these α -glyceryl ethers were found. After hydrogenation the bacteriostatic effect decreased considerably. The fraction inhibited the growth of *M. tuberculosis* in concentrations of 1–3 μ gm. per ml. Sauton medium.

In animal experiments (guinea pigs) a daily dose of 30 mgm. was not active against infection with tubercle bacilli; moreover, the substance proved to be more or less toxic.

Details will be published elsewhere.

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The Xylan of *Rhodymenia palmata*

Barry and Dillon¹ reported the isolation from the red seaweed *Rhodymenia palmata* of a polysaccharide which gave D-xylose on hydrolysis. Our special interest in xylans² has led us to investigate this substance more fully as part of the research programme of the Scottish Seaweed Research Association. Since work on this subject has also been continued in University College, Galway, we have agreed with Prof. T. Dillon to publish a preliminary account of our findings.

The polysaccharide, $[\alpha]_D - 96^\circ$ (H_2O) (cf. esparto xylan $[\alpha]_D - 91^\circ$ (NaOH)) gave xylose only on hydrolysis. Periodate oxidation showed that 80 per cent of the xylose residues possess α -glycol groupings