of each kind, and the quantity of vitamin C in 100 c.c. of plasma was estimated colorimetrically (by means of a photo-electric colorimeter) according to the usual method with the indophenol dye. The results of the preliminary observation are represented graphically.

This figure shows that the rabbits are unable to adjust themselves with the biosynthesis of their high requirements of vitamin C in order to cope with the situation, but that rats can go on synthesizing it even with such a high dose of the keto compound. 6 mgm. of the keto acid per 100 gm. of the body-weight (that is, one-third of the previous dose) can, however, excite the mechanism of biosynthesis of vitamin C to some extent in rabbits.

Work has also been undertaken to study the influence of vitamin C in accelerating the process of ketolysis, as well as in checking the process of glycogenolysis by perfusion experiments with kidney and liver slice respectively in the Ringer's solution modified by Krebs[9]. 5 mgm. of vitamin C per c.c. of the reaction mixture is found to accelerate ketolysis by 70 per cent in thirty minutes in a solution containing 200 mgm. of sodium aceto-acetate per c.c.; and 2 and 5 mgm. of vitamin C have been found to inhibit the degree of glycogenolysis by 37 per cent and 60 per cent respectively in one hour.

Further work is in progress.

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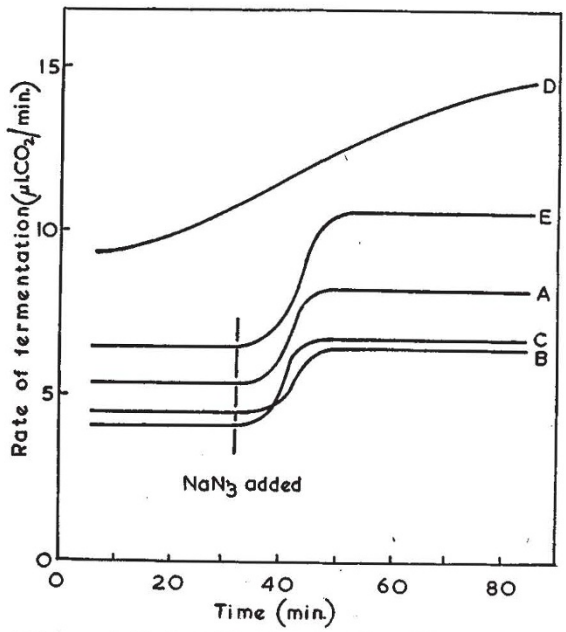
Use of Certain Growth-Inhibitors as Tools in Metabolic Investigations

Cultures of *Saccharomyces carlsbergensis* grown in the presence of sub-optimal amounts of vitamin B6, biotin, or pantothenic acid, and containing in each case less than one tenth of the normal quantity per mgm. of the growth-factor, possessed reduced rates of fermentation, which could be increased within a few minutes at most by addition of the latter. A rapid and marked stimulation was produced also by the addition of sodium azide in suitable concentrations; typical results are shown in the accompanying figure.

Sodium azide did not increase the rate of fermentation of the normal yeast in the medium containing ammonium sulphate (*D*). Growth of each yeast, in contrast, was strongly inhibited by the same concentration of azide.

Sodium azide, 2 : 4-dinitrophenol, and possibly certain other cell-poisons appear to release fermentation and respiration from the controlling influence of endergonic processes, exercised through the transphosphorylation mechanisms[1,2]. In view of this, the above results appear to indicate that vitamin B6, biotin, and pantothenic acid do not participate



Influence of vitamin deficiencies and sodium azide upon rate of fermentation by *S. carlsbergensis*. *A*, B6-deficient; *B*, pantothenic acid-deficient; *C*, biotin-deficient; *D*, and *E*, grown in medium containing all essential growth-factors. The liquid in the manometers contained glucose (3 per cent), KH_2PO_4 (*M*/30), $(NH_4)_2SO_4$ (2·5 mgm./ml.), and usual amounts of other mineral salts; $(NH_4)_2SO_4$ was omitted in *E*. Sodium azide was added at the points indicated; effective concentrations were 5×10^{-5} *M* for *A* and *E*, and 10^{-5} *M* for *B* and *C*. All fermentations were run at 30° C. in an atmosphere of nitrogen. 1 mgm. (dry weight) of yeast was used in each experiment

directly in the reactions involved in alcoholic fermentation; but influence the latter only indirectly by probable functions in the anabolic activities of the cell.

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Retinene$_1$ and Indicator Yellow

Ball, Collins, Morton and Stubbs[1] have found that retinene$_1$ may combine with various proteins and amino-acids to give compounds with the properties of Lythgoe's indicator yellow. This is an interesting advance in the chemistry of vision; but, as stated by Dartnall[2], does not prove that indicator yellow is a "fortuitous artefact having no direct relevance to visual chemistry".

However, Lythgoe's statement[3] that he was unable to extract retinene from bleached visual purple solutions, using petroleum ether alone as a solvent, has recently been shown by me to be erroneous[4]. Lythgoe failed probably because he did not shake his extract with enough vigour to compensate for the slow diffusion of the liberated retinene through the aqueous phase to the petroleum ether. Furthermore, even in the presence of an 'active agent' such as alcohol, retinene is not released to petroleum ether during a period of 2–10 min. after the solution is bleached[4]. This supports Dartnall's view that retinene itself is not split off the visual purple molecule by light. The actual photo-product is probably Lythgoe's transient orange[5].