Riboflavin and Vitamin B_1 in War-time Beers

FOR some time past determinations of these vitamins in beers and stouts, obtained by ordinary retail purchase, have been in progress in these laboratories. For riboflavin a microbiological method[1], latterly improved[2], has been employed, whereas aneurin was measured by a fermentation technique[3] using an appropriate strain of bakers' yeast. When sufficient aneurin was present (in the strongest beers), the thiochrome fluorimetric procedure, involving a fundamentally different principle[4], was used as a check.

The riboflavin results have been surprisingly high in the fourteen beers so far tested, the lowest being 0·47 and the highest 1·2 micrograms per c.c. Strong ales are likely to contain more, but none has so far been tested for riboflavin.

As regards aneurin, results of sixteen beers have ranged from 1 to 6 I.U. per 100 c.c., and here three 'strong' ales have been included.

From other observations in progress, it can already be stated that, while much aneurin is lost from bright beer and is removed with the yeast, almost all the riboflavin present in the original malt remains in the beer, and this is a useful amount.

R. H. HOPKINS.

British School of Malting and Brewing,
University of Birmingham.
Aug. 12.

[1] Snell, E. E., and Strong, F. M., *Ind. Eng. Chem.* (Anal. ed.), **11** 346 (1939).
[2] Barton-Wright, E. C., and Booth, R. G., *Biochem. J.*, **37**, 25 (1943).
[3] Schultz, A. S., Atkin, L., and Frey, C. N., *Ind. Eng. Chem.* (Anal.ed.), **14**, 35 (1942).
[4] Booth, R. G., *J. Soc. Chem. Ind.*, **59**, 181 (1940).

Inactivation of Enzymes by Irradiation

IN consideration of recent communications[1,2] on the chemical action of X-rays on enzymes, and of the renewal of the discussion on the relative role of 'direct hit' and 'indirect action' in enzyme-ray reactions, it seems to us timely to record here certain observations relevant to this question from an investigation in progress on the influence of ultra-violet light on enzymes.

According to Leibowitz *et al.*[3,4,5] the maltose-splitting and the sucrose-splitting activities of taka-diastase must definitely be attributed to two distinct and specifically different agents. Nevertheless, taka-maltase and taka-sucrase show identical inactivation curves when irradiated by ultra-violet light. The inactivation curve of yeast-sucrase, on the other hand, follows a different course. It seems that it is the nature of the accompanying substances (the 'colloid carriers') rather than the enzyme as such that is of decisive importance for the behaviour of the enzyme under irradiation.

It is generally assumed that the susceptibility of enzymes to radiation is increased by dilution. This principle holds in the case of the enzymes named above for dilution with water. It does not hold, however, if the same enzymes are diluted with an inactivated solution of the corresponding enzyme preparation. In other words, when the concentration of the active enzyme molecules is decreased alone, that of the accompanying substances being kept constant, the effect of ultra-violet radiation becomes independent of the concentration of the substrate, that is, the enzyme. Using concentrated solutions of the inactivated material as diluent, dilution actually exerted a protective action on the stability under irradiation of the enzymes. This again tends to confirm the view that accompanying substances are of primary importance in the mechanism of enzyme inactivation by irradiation.

G. GOLDHABER.

Dept. of Radiology,

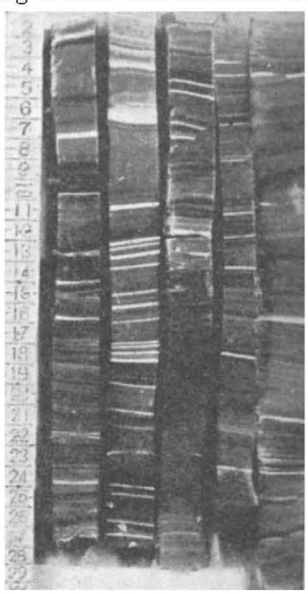
J. LEIBOWITZ.

Dept. of Chemistry,
Cancer Research Laboratories,
Hebrew University,
Jerusalem.
June 15.

[1] Dale, Meredith and Tweedie, NATURE, **151**, 280 (1943).
[2] Broda, NATURE, **151**, 448 (1943).
[3] Leibowitz and Hestrin, NATURE, **141**, 552 (1938).
[4] Leibowitz and Hestrin, NATURE, **143**, 333 (1939).
[5] Hestrin, *Enzymologia*, **8**, 193 (1940).

Bacteria in the Bottom Sediments of the Dead Sea

IN order to investigate the presence of different physiological groups of bacteria in the different layers of the bottom sediments of the Dead Sea[1,2,3], it was essential to obtain profiles of mud samples. With a coring instrument designed according to the device of Emery and Dietz[4] a number of profiles 10–170 cm. long, were obtained from depths of 70–330 m. at different places in the Dead Sea during December 1941. It was found that the thickness of the mud layer covering the surface of the bed of the Sea varies in different places from a few centimetres to more than 170 cm. In one place about 6 km. south-west from the northern shore, a profile 170 cm. long was obtained from a depth of 100 m. On dissecting the profile longitudinally, a beautiful 'spectrum of layers', of different colours—black, dark-blue, grey, brown, and white—was revealed (Fig. 1). It is interesting to note that the zones of sedimenta-



a *b* *c* *d* *e*

'SPECTRUM' OF LAYERS OF A PROFILE 170 CM. LONG OBTAINED FROM THE BOTTOM OF THE DEAD SEA AT A DEPTH OF 100 M.
(*a*) 6–32 cm. (*b*) 32–58 cm. (*c*) 58–85 cm. (*d*) 85–110 cm. (*e*) 110–139 cm.