

ever, the curare is washed out with Ringer's the effect reappears *pari passu* with the gradual reestablishment of the neuromuscular junction as indicated by the increasing height of the muscular contraction in indirect stimulation. The reaction is fine enough to serve in the assay of parathormone in conjunction with the ordinary blood calcium method. The parathormone effect is weakened by reducing the CaCl_2 content of the perfusion fluid. CaCl_2 can be replaced partially by SrCl_2 . CaCl_2 also evokes an increase in the height of contraction in the perfusion preparation. Therefore, the question was examined as to whether parathormone influences the calcium effect. It was found that parathormone in a concentration which in itself did not influence the height of contraction increased the effect of calcium considerably. The height of contraction is considerably more increased by CaCl_2 in the presence of ineffective parathormone concentrations than in its absence. Such an effect of parathormone seems to be absent in the heart.

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Effect of Ethanol upon Fermentative Activity of Zymin.

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In studies on the effect of the composition of the medium upon the cell-free alcohol fermentation by zymin, it was soon evident that the zymin is very sensitive to relatively low concentrations of

TABLE I.

Relative rates of CO_2 production by yeast (from data of Rahn) and by zymin in the presence of varying concentrations of ethanol. Figures in () read from graph.

% Ethanol	Yeast	Zymin	% Ethanol	Yeast
0	100	100	4.93	60
0.38	(97)	89	5.48	55
0.94	(93)	75	7.40	38
1.31	(90)	61	9.55	24
1.37	87	(62)	9.70	29
1.86	(85)	50	9.86	27
2.59	(80)	43	11.9	16
2.74	77	(38)	12.1	13
3.65	(71)	28	13.1	14
4.11	65	(28)	13.3	15
4.70	(63)	28	14.3	12
4.77	70	—		

ethanol. In Table I are given quantitative data on the effect of various concentrations of ethanol upon the relative rates of fermentation based upon the production of carbon dioxide. There are also given the data obtained by Rahn¹ for yeast. An analysis of the latter data shows a linear relation between the concentration of alcohol and the relative rate of CO₂ production, up to a concentration of about 10%. From this point there is a slow and practically constant rate even in the presence of as high as 14%. There is a linear relationship for the zymin up to about 1.8% alcohol from which point there is also evident the low but continuous fermentation. The equations for the linear portions of the curve are

Relative rate for yeast = $100 - 2.1 \times \% \text{ ethanol}$.

Relative rate for zymin = $100 - 22.5 \times \% \text{ ethanol}$.

It is at once evident that the zymin is much more sensitive to the alcohol than is the yeast. Harden² reports that there is a 0-20% diminution of the fermentative activity of yeast juice in the presence of a 6% ethanol and a 75% decrease for 14% ethanol. In the preparation of zymin there is evidently removed some factor which protects against alcohol. The addition of the extracted material did not decrease the sensitivity. Experiments, the details of which will be published later, show that while the addition of phosphate gives the expected increase in activity there is no decrease in sensitivity toward ethanol; the addition of the appropriate concentration of ammonium chloride not only increases the fermentative activity, with or without the addition of phosphate, but very materially decreases the sensitivity toward ethanol.

¹ Rahn, Otto, *J. Bact.*, 1929, **18**, 207.

² Harden, A., *Alcoholic fermentation*.