LXXXI. NOTE ON THE FERMENTATION OF *i*-INOSITOL.

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IN the course of other work on the metabolism of carbohydrates it was found desirable to know whether there was any inter-relationship, under normal conditions, between inositol and glucose. Under pathological conditions, such as in phloridzinised dogs, Greenwald and Weiss [1917] have shown that inositol administered is quantitatively excreted as glucose, while in diabetes insipidus it has been found by Strauss [1870], Külz [1875] and McIlraith [1892] in considerable quantity in the urine.

As a preliminary to the investigation referred to, the literature was searched for work on the decomposition of inositol by micro-organisms, as it was thought that this might throw light on some of the possible reactions concerned. Despite the common use in bacteriology of this substance as a test medium, no information could be obtained other than "acid and gas." The general impression appears to be however that lactic acid is the principal product formed.

On carrying out on a small scale some preliminary fermentations of inositol, employing *Bacillus lactis aerogenes*, we were somewhat surprised to be unable to obtain evidence of the presence of this acid, though the reaction mixture was markedly acid and the organism active. Another and larger experiment was planned, but before this was carried out we became aware of some previous unpublished work of Professor Harden in this connection. As our experiment would of necessity have been on a smaller scale than Professor Harden's, it was likely that our analysis would have been less accurate, and it was considered needless to repeat it. Professor Harden has kindly consented to his figures being quoted here, attention being drawn to the fact that, owing to no good method being available, any residual inositol was not determined.

10 g. inositol gave:—

Alcohol	...	...	...	...	2.33 g.
Acetic acid	...	...	...	...	1.43 „
Formic	„	...	...	...	0.10 „
Lactic	„	...	...	...	0.54 „
Succinic	„	...	...	...	2.22 „
CO ₂	...	...	...	...	1.92 „
Hydrogen also evolved.					
Total weight of products	...	...	...	...	8.54 „

In view of the apparent lack of definite information on this point it is thought that the figures are worthy of record.

Regarding the formation of glucose as an intermediate product in the fermentation of inositol, it may at once be said that all observations have yielded negative results. Fermentations of inositol by this bacillus, alone, in peptone broth, and in asparagine-salt mixtures have failed to give products among which glucose could be detected. Polarimetric observations also showed, in the reaction mixtures, no greater optical activity than in the controls. By the employment of the "fixation" method of Neuberg [1920], we have failed to obtain any product which could be isolated as a hydrazone by the use of *p*-nitrophenylhydrazine, or phenylhydrazine, and it is concluded that acetaldehyde is not formed. This observation, together with that of Neuberg [1920] that succinic acid is not formed from glucose by *Bacillus lactis aerogenes*, would appear to be evidence against the opening of the reduced hydroxybenzene ring with the formation of glucose as an intermediate product.

The work is incomplete, but, as we are unable to continue it in the immediate future, it is communicated in this note.

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