Series C. Non-phenolic steroids. 25–250 μgm. of androstenediol dissolved in 0·2 c.c. glacial acetic acid is mixed with 1·8 c.c. 85 per cent phosphoric acid, warmed at 55° C. for fifteen minutes, cooled and diluted to 5 c.c. with glacial acetic acid. After standing at room temperature in the dark for seventy-five minutes a violet colour and violet fluorescence (ultra-violet) develops.

This colour reaction appears to be specific for androstenediol and is not given by cholesterol, pregnandiol, cholic acid, 17 ethinyl androstenediol, progesterone, desoxycorticosterone acetate, pregnenolone, $\Delta^{5:6,\ 16:17}$-pregnanedienolone 3 : 20, *trans* testosterone and methyl testosterone. *trans trans* Methylandrostenediol 3 : 17 gives a bright green fluorescence with very little colour, whereas dehydroandrosterone gives an unstable deep pink colour.

Conditions influencing the ease and degree of dehydration of the compounds under test are evidently of considerable importance in the development of colour and fluorescence.

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Fermentation of Pyruvate, β-Hydroxybutyrate and of C_4-dicarboxylic Acids by some Butyric Acid-forming Organisms

According to several authors, pyruvate is an intermediate in the formation of C_4-compounds in the butanol-acetone fermentation. According to others, pyruvate is not such an intermediate and gives rise only to acetate when fermented by resting cells of butyl organisms. The different results obtained by the various authors can be explained by the utilization of different strains. Thus, we have observed that washed cells of the strain *GR*4 of *Clostridium saccharobutyricum* Schattenfroh and Grassberger, when acting on pyruvate, give rise to acetate and butyrate. The same results are obtained with suspensions of *Cl. acetobutylicum* (Weizmann) McCoy, Fred, Peterson and Hastings, strain *Fd*11, whereas strain *PC*48 and some other strains of the same organism give rise only to acetate when acting on pyruvate. These last strains may need a coupled reaction to ferment pyruvate in the normal C_4-compounds.

M/1,000 arsenite totally suppresses butyric acid formation from pyruvate with those strains able to give both acetate and butyrate from pyruvate[1]. The total volatile acid is about 30 per cent lower in the presence of arsenite than in the controls, but only acetic acid is formed. This suggests a possible transformation of acetate into butyrate during normal fermentation. Such a transformation has been found to occur in cultures in experiments using carbon-13 by Wood, Brown and Werkman[2]. Further experimental evidence for this fact has been adduced by us on the course of pyruvate fermentation by resting cells. At the beginning of the experiment, pure acetic acid was obtained, while the ratio butyric/acetic acid eventually reached 1/1 and even 2/1 (Duclaux distillation data).

Acetate alone, or in the presence of hydrogen (with and without phenosafranine), does not give rise to butyrate.

Peldàn[3] suggested that β-hydroxybutyrate could be an intermediate in the formation of butyric acid. We have found that this compound is readily fermented at *p*H 7 by washed suspensions of all the strains of *Cl. saccharobutyricum* and *Cl. acetobutylicum* tested, whether or not they were able to form butyrate from pyruvate. The volatile acid products of this fermentation were acetic and butyric acids in the ratio 1/1, independently of the time of incubation. Butyrate formation from β-hydroxybutyrate is unaffected by arsenite. Our results on β-hydroxybutyrate fermentation do not agree with the conclusions drawn by Johnson, Peterson and Fred[4] from their studies on growing cultures.

Our strains, in accordance with the findings of Simon and Weizmann[5], do not ferment succinate. On the contrary, fumarate, oxalacetate, and to a lesser extent, malate, are well fermented to butyric and acetic acid by *Cl. saccharobutyricum* (strain *GR*4).

We propose as a working hypothesis the following scheme for butyric acid formation:

pyruvate → acetate → unknown intermediates → β-hydroxybutyrate → acetate + butyrate.

According to this hypothesis, arsenite acts on a stage anterior to the formation of β-hydroxybutyrate.

A detailed account of the experiments will shortly be published elsewhere.

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British Abstracts

In my section of the account published in *Nature* of August 21 of the Royal Society Scientific Information Conference, I stated that *British Abstracts* were of the 'indicative', that is, a briefer type; other abstracts were of the 'informative', that is, a longer type. That is how those various services describe the abstracts they publish. Fear has been expressed lest those unfamiliar with *British Abstracts* or with the use of these words, 'indicative' and 'informative', in this connexion may infer that *British Abstracts* differ radically from all the others, and may be even merely extended titles. This, of course, is not so.

The papers circulated to the Conference explained that an 'indicative' abstract aims at giving the reader sufficient information to decide whether he should read the original paper or not, and that while the 'informative' abstract is usually longer and contains more data, many of the abstracts published by the 'informative' services are of the 'indicative' type.

I am left with some doubt, however, regarding the aptness and usefulness of these words in this connexion.

David Chadwick