XXVII.—*On the transformations of Citric, Butyric, and Valerianic Acids, with reference to the artificial production of Succinic Acid.*

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[Abstract.]

THE author's experiments confirm the result formerly obtained by How and by Dessaignes, that citrate of lime fermented in contact with putrefying casein, yields butyric but not succinic acid. Now as malic acid, which has nearly the same composition as citric acid, has been shown by Dessaignes to yield, under similar circumstances, first succinic and then butyric acid, it appeared not improbable that citric acid might also, by certain modifications of the conditions of the decomposition, be made to yield succinic acid.

Citrate of soda, mixed with a considerable quantity of carbonate was therefore fermented for some weeks with uncooked putrid beef; the products obtained were butyric acid, a compound which imparted a peculiar odour to the liquid, and carbonic acid which converted the carbonate of soda into bicarbonate :

but no succinic acid.

Citrate of lime, however, fermented with a small quantity of boiled beef, yielded butyric acid and a small quantity of succinic acid.

Citric acid oxidised by permanganate of potash at a temperature a little above summer-heat, was found to yield nothing but oxalic acid :

Butyrate of lime oxidised by permanganate of potash at a temperature a little below the boiling point of the liquid, yielded succinic acid and acetic acid :

The acetic acid unites with the butyric acid to form butyro-acetic acid, a compound which obstinately resists the ordinary action of the permanganate. Nevertheless, the conversion of butyric acid into succinic acid in this manner, was found to be much more rapid than by oxidation with nitric acid, the process formerly pointed out by Dessaignes.

Valerianic acid treated with permanganate of potash yields, in like manner, succinic acid and aceto-valerianic acid.

The ethyl-compounds of butyric and valerianic acids are oxidised by the permanganate more quickly than the acids themselves.

The author considers it probable also that suberic acid may be formed in small quantity in these reactions.