

efficacious, whereas vagotomy alone was without effect in modifying the average minimal fatal dose.

These facts are interpreted to mean that in the intact rabbit, respiratory embarrassment must exist, either through spasm of the glottis or other obstruction, in such a way that the asphyxial element thereby induced very markedly contributed to the central injury produced by cocaine.

### 3158

#### Sulphur metabolism in yeast.

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The studies of Swoboda<sup>1</sup> in this laboratory indicate that cystin added to certain media stimulates yeast growth. This suggested a more intensive study on the actual utilization of various forms of sulphur in yeast growth.

The forms of sulphur studied were sulphate, sulphide, cystine, cystein, cysteinic acid, taurine and taurocholic acid. These were added to the usual synthetic medium as employed by Williams,<sup>2</sup> Miller,<sup>3</sup> and Swoboda,<sup>1</sup> with and without the "biose vitamine" and without the usual sulphate content. The yield of yeast was determined by weighing the yeast obtained after a growth period of eighteen hours. The saccharose and asparagin used in the media were purified to remove sulphur containing substances as completely as possible.

The results obtained were as follows:

1. Inorganic sulphate is the best form of sulphur for yeast growth, especially if magnesium is present with an ample amount of the biose vitamine. Neither magnesium nor sulphate could be substituted for the biose vitamine.

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<sup>1</sup> Swoboda, F. K., *J. Biol. Chem.*, 1922, lii, 91.

<sup>2</sup> Williams, R. J., *J. Biol. Chem.*, 1920, xlii, 259.

<sup>3</sup> Miller, Elizabeth M., *J. Biol. Chem.*, 1921, xlviii, 329.

2. Sulphide sulphur added as hydrogen sulphide in concentrations of 0.0022 mg. per 125 cc. may be used as a sulphur source by growing yeast. In higher concentrations it retards yeast growth, especially when a good sulphate containing medium is employed.

3. Cystine stimulates yeast growth slightly in concentrations of 1 to 4 mg. per 125 cc. medium. In higher concentrations and especially in a good sulphate containing medium it retards yeast growth. Cysteine behaves similarly. Possibly the harmful effect of these is in part due to their partial conversion into hydrogen sulphide.

4. Cystine sulphur is partly utilized in synthesizing new yeast protein, but a part of it also remains in the medium as sulphate.

5. In otherwise sulphur free media cysteinic acid stimulates yeast growth very slightly, but in a sulphate containing medium it retards the same.

6. Taurine in concentrations of 2 to 20 milligrams per 125 cc. has no appreciable effect on yeast growth.

7. Taurocholic acid in concentrations of 1 mg. or more per 125 cc. was toxic even in sulphate media.

### 3159

#### Specific absorption studies upon calf rennin.

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The question of the identity of pepsin and rennin has been under consideration for many years, Pikelharing,<sup>1</sup> Pawlow<sup>2</sup> and others, holding to the view that pepsin and rennin activities were not distinct, with Hammarsten,<sup>3</sup> and more recently Fenger,<sup>4</sup> claim that the two activities are different in character.

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<sup>1</sup> Pikelharing, C. A., *Z. Physiol. Chem.*, 1896, xxii, 233-44.

<sup>2</sup> Pawlow, J. P., *Z. Physiol. Chem.*, 1904, xlii, 415; Schmidt-Nielsen, S., *Z. Physiol. Chem.*, 1906, xlvi, 92.

<sup>3</sup> Hammarsten, O., *Z. Physiol. Chem.*, 1911, lxxiv, 142-68; *Ibid.*, 1918, cii, 33-77.

<sup>4</sup> Fenger, F., *J. Am. Chem. Soc.*, 1923, 249-55.