

which give rise to granule colonies. If the broth is plated on saccharose agar, direct examination under the microscope shows that granule colonies grow mostly in places where no bacteria were deposited.

The phenomena observed with Oerskov's bacillus show, in addition to characteristic differences, close similarities to the phenomena described in previous notes with Gram-positive aerobic bacilli.^{2, 3} As we have already indicated, these phenomena are probably closely related to the mucoid fermentations and the production of bacterial capsules.

We have formed so far no definite opinion concerning the nature of the amorphous substance and its connection with the bacteria, though it is probable from analogies to the Gram positive bacteria, that it contains living elements different from the usual bacterial forms.

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Presence of Vitamin B₁ in the Gastric Juice.

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Impaired functioning of the digestive system was for a long time known to be one of the earliest and most prominent manifestations of experimental vitamin-B deficiency. A diminution of gastric secretion was also reported repeatedly (Miyadera,¹ Shinoda,² Farnum,³ Gilman⁴). The data concerning the gastric secretion were however not very consistent, and furthermore there were considerable difficulties in interpretation for the reason that the experiments quoted above were complicated by many other factors, particularly by a loss of appetite and usually a high degree of inanition in the experimental animals. Recently it was demonstrated in this laboratory that a marked diminution of gastric secretion occurs in dogs on

² Dienes, L., PROC. SOC. EXP. BIOL. AND MED., 1932, **29**, 1205; 1934, **31**, 1211.

³ Peirson, O., and Dienes, L., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 1208.

¹ Miyadera, K., *Biochem. Z.*, 1921, **124**, 244.

² Shinoda, G., *Z. f. d. ges. exp. Med.*, 1924, **40**, 274.

³ Farnum, M. B., *Arch. Int. Med.*, 1926, **37**, 42.

⁴ Gilman, A., Dissertation, Yale University, 1931. Quoted from Cowgill, G. R., *J. Am. Med. Assn.*, June 18, 1932.

a diet lacking vitamin B even under conditions where the animals preserve an excellent appetite and well maintain their body weight (Babkin,⁵ Webster and Armour^{6, 7}). The withdrawal of yeast, as a source of vitamin B, from the standard diet practically abolished the gastric secretion in response to sham-feeding, to histamine, and to intra-intestinal administration of alcohol, as well as to introduction of food into the duodenum. The importance for normal gastric secretion of an adequate supply of vitamin B₁ was emphasized recently by Cowgill and Gilman.⁸ The fact that with a diet lacking vitamin B the gastric glands are resistant to *any* kind of stimuli suggests that some of the factors concerned in vitamin B complex may play a vital part in the intimate mechanism of gastric glandular activity. In such a case one might expect the presence of such a factor also in the product of activity, *i. e.*, in the gastric secretion.

The experimental study which we have carried out along these lines has indeed provided ample evidence that at least the anti-neuritic principle, vitamin B₁, is a normal constituent of canine gastric juice.

The presence of an anti-neuritic factor in pure normal gastric juice of the dog was demonstrated by means of curative tests on polyneuritic pigeons (technique according to Kinnersley, Peters and Reader,⁹ Guha and Drummond¹⁰). Gastric juice was collected on sham-feeding from 3 dogs with gastric fistula and oesophagotomy, which were receiving a diet of fresh raw meat, milk and oatmeal porridge. Only water-clear secretion was used and all the necessary measures were taken to prevent any growth of micro-organisms in the gastric juice or in the concentrates prepared from it. The anti-neuritic activity was demonstrated in the concentrates, which were prepared from the protein-free filtrate of gastric juice by adsorption on Fuller's earth at pH 4.5, followed by extraction of the adsorbates with Ba(OH)₂. Curative day doses for pigeons as determined with the above-mentioned concentrates were equivalent to from 100 to 200 cc. gastric juice, containing respectively 0.8 to 1.6 mg. nitrogen and 7 to 14 mg. organic material. In an attempt to investigate the chemical properties of the anti-neuritic constituent

⁵ Babkin, B. P., *Can. Med. Assn. J.*, 1933, **29**, 5.

⁶ Webster, D. R., and Armour, J. C., *Proc. Soc. Exp. Biol. and Med.*, 1933, **30**, 1297.

⁷ Webster, D. R., and Armour, J. C., *Proc. Soc. Exp. Biol. and Med.*, 1934, **31**, 463.

⁸ Cowgill, G. R., and Gilman, A., *Arch. Int. Med.*, 1934, **53**, 58.

⁹ Kinnersley, H. W., Peters, R. A., and Reader, V., *Biochem. J.*, 1928, **22**, 276.

¹⁰ Guha, B. C., and Drummond, J. C., *Biochem. J.*, 1929, **23**, 880.

of gastric juice it was found that this substance belongs to the group of nitrogenous bases not precipitable by lead acetate in acid, neutral or slightly alkaline medium, but precipitable by an excess of phosphotungstic acid in acid medium (5% sulphuric acid). On fractionation by the silver-baryta method all the anti-neuritic activity was recovered in the silver precipitate obtained at pH between 5.5 and 7.0. The activity of the concentrate prepared from this silver fraction by extraction with a slight excess of hydrochloric acid corresponded to 75 to 200 cc. of gastric juice as curative day doses for pigeons. This amount of the fraction contained from 0.15 to 0.4 mg. nitrogen. The chemical properties and the mode of action of the concentrates studied strongly suggest that the active principle is vitamin B₁. Therefore vitamin B₁ should be regarded as a normal constituent of canine gastric juice.

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Haemodynamic Effects of Extracts from Traumatized Limbs.

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Two theories have recently received most attention as to the etiology of traumatic shock. These are (1) the absorption of metabolic toxins from the traumatized area (Cannon¹) and (2) the local loss of blood and/or plasma (Blalock,² Phemister³). The work of various investigators showing certain tissue extracts to be circulatory depressants has frequently been cited in favor of the "toxic theory". The fact has been largely overlooked, however, that one may obtain both pressor and depressor substances from most tissues, and that either type may predominate according to the method of extraction (Collip⁴).

The present experiments are upon the effects on the blood pressure of extracts from traumatized limbs obtained by an hydraulic press. This method of extraction probably does not alter the proportions of the various hemodynamic substances present in the tissue.

¹ Cannon, W. B., *Traumatic Shock*, 1923.

² Blalock, A., *Arch. Surg.*, 1930, **20**, 959.

³ Parsons, E., and Phemister, D. B., *Surg. Gynecol. and Obst.*, 1930, **51**, 196.
Roome, N. W., Keith, W. S., and Phemister, D. B., *Ibid.*, 1933, **56**, 161.

⁴ Collip, J. B., *J. Physiol.*, 1928, **66**, 416.