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The influence of diet and of B. acidophilus ingestion on intestinal putrefaction.

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A series of about two hundred and fifty cases, including normal individuals, a large number of patients representing a variety of pathological conditions, and a group of patients suffering from symptoms supposedly due to intestinal disorders such as constipation, autointoxication, colitis, arthritis, eczema and urticaria, have been treated by dietary restrictions affecting the protein foods. About six hundred and fifty quantitative determinations of the indican, phenols, total nitrogen and creatinine excreted in the twenty-four hour urines have been made. It has been found that a decrease in the total nitrogen intake (meat and eggs) results in a corresponding decrease in the putrefactive products excreted by the same patients when on a higher protein diet. The phenols, as determined by the method of Folin and Denis[1], however, showed much less tendency toward significant changes due to diet than did indican. In as much as Tisdall[2] has suggested the non-specificity of this method for determining phenols, our results would lend support to the conclusion that this method for phenol estimation is of little value.

The effect of feeding one liter of *B. acidophilus* milk, prepared according to Rettger and Cheplin[3] from Rettger's cultures, and 100 grams of milk sugar daily, in addition to ordinary diets, was studied in eight patients suffering from constipation, eczema and colitis. No milk was allowed in the diet on the control days previous to the feeding of the acidophilus milk. The absolute amount of protein in the daily diet was kept as nearly constant as possible throughout the periods of observation, although there was of necessity a decrease in certain protein foods to allow for

[1] Folin, O., and Denis, W., *J. Biol. Chem.*, 1915, xxii, 305.

[2] Tisdall, F. F., *J. Biol. Chem.*, 1920, xliv, 409.

[3] Rettger, L. F., and Cheplin, H. A., *The Intestinal Flora*, Yale University Press, 1921.

that ingested in the milk. The time required to bring about practically complete transformation of the intestinal flora to the acidophilus type varied with the individuals studied, from several days to several weeks. This observation is based on frequent cultural examinations of the stools according to Rettger's technique. In general, the excretion of indican (and of phenols to a less extent), increased early in the treatment with acidophilus, followed by a gradual lowering as the treatment continued; the amounts of these products did not usually fall below those excreted before the acidophilus feeding. If indican excretion may be taken as an index of intestinal putrefaction, it appears that implantation of *B. acidophilus* in the intestine does not necessarily lower putrefactive processes in the intestine.

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Is cystin synthesized in the animal body?

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We undertook a series of experiments in order to determine which of the amino acids occurring in proteins were possible of synthesis in the animal organism. According to Abderhalden, any of the aliphatic amino acids should be synthesized, but probably none of the hetero-cyclic or aromatic acids. It has already been shown that glycocoll can be built in the animal organism[1] [2] and we have previously shown[3] that glycocoll and also glutamine can be synthesized in the human body at the expense of nitrogen which would otherwise be found in the urea portion of the urine, and peculiarly that both acids are prepared simultaneously as well as singly.

Recent feeding experiments have shown that cystin is a necessary amino acid in protein if growth or maintenance of body weight is desired, therefore indicating that neither cystin nor cystein is synthesized in the organism.

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[1] McCollum, E. V., and Hoogland, D., *Jour. Biol. Chem.*, 1913, xvi, 311.

[2] Lewis, H. B., *Jour. Biol. Chem.*, 1914, xviii, 225.

[3] Shiple, G., and Sherwin, C. P., *Jour. Amer. Chem. Soc.*, 1922, xliv, 618.