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The vitamines of yeast and their rôle in animal nutrition.

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The question whether pigeons and rats require for their well-being the same vitamine B has been discussed at length by Mitchell and Emmett a few years ago with the conclusion that vitamine B must be different from the antineuritic substance. Funk and Macallum have tested the phosphotungstate precipitate obtained from yeast and have found that while it was strongly curative for avian beriberi, it induced only moderate growth in rats. The present writers were able to show recently that by fractional adsorption with fuller's earth or norit it is possible in most cases to effect an almost quantitative separation of the B-vitamine, curative for avian beriberi from another substance, which we provisionally have called vitamine D and which acts on yeast and certain bacteria. In practice the separation is effected as follows: One liter of autolyzed yeast is shaken with 50 g. of fuller's earth; the filtrate which in the majority of cases was found inactive for avian beriberi was treated twice with the double amount of fuller's earth, the combined precipitates carrying down quantitatively the vitamine D, the last filtrate being devoid of the two above-mentioned substances.

Having succeeded in this separation (the procedure varying somewhat with different samples of autolyzed yeast) we thought it worth while to test out the fractions obtained on animals, making simultanous tests on pigeons, rats, yeast and streptococci. The experiments carried out with six rats and four pigeons in every case will be repeated and extended and the present communication is only of a preliminary character. While the pigeons were found to need only the vitamine B when fed on a vitamine-free diet, the rats exhibited a somewhat different behavior. They were fed the usual so-called synthetic diet with cod liver oil as source of vitamine A. The rats receiving the vitamine B or D fraction as an addition grew only for a few weeks at a slow rate and started to die out after two months. While increasing

the amount of one vitamine did not have any effect, the addition of the missing component in both of the above cases caused a prompt resumption of growth. The rats given both B and D from the start together with the last filtrate, which contains neither B nor D, showed a normal behavior both in regard to growth and appearance. The influence of the last filtrate does not seem to be very important but has to be investigated.

The results suggest that the rats and possibly other mammals require, besides the vitamine A, at least two vitamines of the B type, namely the B and D vitamine, for their well-being and growth.

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Comparative buffering value of American peptones.

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Some time ago one of us[1] reported before this Society the results of the inquiry into the effect of the composition of the medium as affecting the reliability of the cultural methods of identification of bacteria, and has particularly insisted on the rôle of the buffer and on necessity of quantitative adjustment of media in respect to its buffer content.

In the present investigation we have attempted to determine the buffer content of a few of the commercial peptones with the view of determining the limits of possible variation in the buffer content in the media prepared in different laboratories as due to the choice of peptone alone. The method used was that of determining electrometrically the hydrogen ion concentration of the various peptone solutions before and after the addition to them of measured amounts of acid and alkali respectively. The study demonstrated the fact that initial reaction of different peptones varies within fairly broad limits, that due to complexity of composition the buffering action of any given peptone varies at different zones of hydrogen ion concentration, and that buffering action of one peptone at a given hydrogen ion concentration may

[1] Bronfenbrenner and Schlesinger, PROC. SOC. EXP. BIOL. AND MED., 1918, xvi, 44.