Lewis's soluble red color is due to the indol substance. I have not met with any insoluble red pigment in my tests with the Ehrlich method. The purple or blue coloration appears to be independent of indol production, as indicated by the following observations:

1. If the tubes are shaken up with chloroform without the addition of persulphate the supernatant liquid is colorless, but on standing gradually assumes a purplish and eventually either a purple-blue or blue color. Often of two duplicate tubes one was purple-blue, the other blue.

2. The addition of a few drops of fuming nitric acid or hydrogen peroxide (oxidizing agents) to the decanted supernatant liquid produces instantly the same changes in color observed gradually on long exposure.

3. The blue color reaction was obtained in uninoculated controls and in solutions of peptone in distilled water which have been treated with the aldehyde and concentrated hydrochloric acid. This shows that this coloration is independent of the indol reaction.

Since the aldehyde and acid alone do not give this reaction it is apparent that the coloration must be due either to the peptone or to some of the substances present in the peptone mixtures.

7 (824)

The influence of butter-fat on growth.

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When young rats are fed on mixtures of isolated food substances and inorganic salts such as the "protein-free milk" foods earlier described by the authors,[1] they cease sooner or later to grow and

[1] Osborne and Mendel, "Feeding Experiments with Isolated Food-Substances," Carnegie Institution of Washington, Publication 156, Parts I and II, 1911; "The Role of Different Proteins in Nutrition and Growth," *Science*, XXXIV, pp. 722–732, 1911; "Feeding Experiments with Fat-Free Food Mixtures," *Journ. of Biol. Chem.*, XII, pp. 81–89, 1912; "Beobachtungen über Wachstum bei Fütterungsversuchen mit isolierten Nahrungssubstanzen," *Zeitschr. f. physiol. Chem.*, LXXX, pp. 307–370, 1912.

they then decline upon these diets. Milk food speedily brings restoration of growth; and it has been shown that the "essential" accessory factor responsible for this effect is a component of the cream which is present in butter.[1] Further experiments now indicate that the butter-fat separated by centrifugal methods from unsalted butter contains the substance which averts the cessation of growth and possible nutritive decline noted when lard is used instead of milk-fat.

Butter-fat thus prepared is free from nitrogen, phosphorus and ash-yielding constituents. The growth-promoting substance therefore is not a phosphatide (lecithin) or an inorganic compound.

8 (825)

The presence of creatinine in muscle.

(PRELIMINARY PAPER.)

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The presence of creatinine in muscle has, in general, been denied by those who have undertaken a study of this question. In earlier communications[2] upon various phases of the creatine-creatinine problem, evidence has been presented which is strongly in harmony with the metabolic relationship of these two substances. Since creatinine is so rapidly eliminated from the body, its presence in the muscle tissue would not be expected in large quantity. On the other hand, if creatinine originates from creatine, this transformation might be expected to take place in the muscle tissue, and on this account it would seem that, with sufficiently delicate and reliable methods, it ought to be possible

[1] Osborne and Mendel, "The Relation of Growth to the Chemical Constituents of the Diet," *Journ. of Biol. Chem.*, XV, pp. 311–326, 1913; also McCollum and Davis, "The Necessity of Certain Lipins in the Diet During Growth," *Journ. of Biol. Chem.*, XV, pp. 167–175, 1913.

[2] See Myers and Fine, PROC. SOC. EXP. BIOL. AND MED., 1912–13, X, pp. 10, 12 and 168; also *Jour. Biol. Chem.*, 1913, XIV, p. 9; XV, pp. 283 and 305; XVI, p. 169.