many variations of detail occur every record gives evidence of more than an evenly rounded top. During the period of cardiac ejection, the curve rises slowly and reaches a rounded summit and the wave slowly declines until the movement of cardiac relaxation, after which a sudden and abrupt fall occurs. When curves are written with too sensitive manometers the flattened top is less apparent to the eye, while, if also written on slowly moving paper as was done by Straub, this top fades to a mere suggestion requiring careful scrutiny to detect.

The results, therefore, corroborate the work of Piper and C. Tigerstedt that, during the systole of normal beats, a more or less flattened top (plateau ?) occurs while the records of Straub are not clearly typical because they were too large for the pressure change and written on too slowly moving paper. With periodic manometers vibrations are superimposed on the ascending and descending limbs but these are either lost when the manometer is aperiodic or so sensitive that a very large record is written.

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A comparative study of the Ehrlich and Salkowski tests for indol production by bacteria.

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One of the bio-chemical reactions extensively used for the identification of bacterial types is the production of indol from peptone in a peptone-water solution. Of the various tests that might be used for the detection of that substance the one most widely adopted in this country is the so-called Salkowski test ($H_2SO_4 + KNO_2$). In Germany Bohme (1905) and in England Marshall (1907) have found, after a comparative study, that the Ehrlich reaction (Paradimethylamidobenzaldehyde + HCl) gives more uniform and constant results.

This study was undertaken in order to obtain further light on the relative reliability of the two tests. Seventy-five organisms,

representing the various members of the colon-typhoid group, were used. Duplicate peptone broth tubes of each strain were incubated at 37° C. for four days. The contents of the tubes was then divided in half and the half portions subjected respectively to the two tests.

Twenty-eight of the seventy-five strains were positive in both duplicate tubes with both tests. Thirty-seven were uniformly negative with both tests. Five were positive in both controls with the Ehrlich test and positive in one tube and negative in the other with the Salkowski. Finally five tubes were uniformly positive with the Salkowski and negative with the Ehrlich test. The five cases in which the Salkowski test was positive and the Ehrlich test negative illustrate the fact brought out by Bohme and Marshall that the Salkowski test may give erroneously positive results when indol is not present. This error seems to be due to some red substance other than nitroso-indol but which may easily be mistaken for it. If the test is carefully performed this reddening can, however, easily be distinguished from the nitroso-indol red by the fact that it diffuses rapidly throughout the entire tube instead of remaining as a ring between the two liquids. This characteristic coloration was obtained in all those cases which gave repeated negative results with the Ehrlich test, and unlike the nitroso-indol red it was found to be insoluble in chloroform. The five other aberrant results in which the Ehrlich test was positive and the Salkowski test positive in one tube and negative in the other illustrate the possibility of an error in the other direction. I am inclined to think that the negative Salkowski tests in this case were perhaps due to a rapid oxidation of the red coloring matter. On the whole it is quite evident that the Ehrlich test is the more reliable of the two and should displace the other.

An interesting phenomenon in connection with the Ehrlich test, first called attention to by Seidelin, was also observed by me. This consists in the appearance of a purple to blue color, on the addition of the reagents, which unlike the indol red is insoluble in chloroform. Lewis, working with Seidelin, attributes a special significance to this reaction and reports three distinct colorations:

1. Soluble and insoluble red.
2. Soluble red and insoluble purple or blue.
3. No soluble red but insoluble blue or purple.

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.

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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.