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Rapid determination of surface tension.

By ROBERT G. GREEN (by invitation).

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An apparatus was demonstrated by means of which the surface tension of a liquid is rapidly determined by the drop-weight method. From one to six drops of the liquid to be measured is required. The apparatus consists essentially of a delicate torsion wire balance and an adjustable scale on which the surface tension is read in dynes per centimeter.

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The influence of the surface tension of the culture medium on bacterial growth.

By W. P. LARSON.

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Pellicle-forming bacteria such as the *B. tuberculosis*, *B. subtilis* and others of that group which habitually grow upon the surface of liquid medium, will grow throughout the body of the medium by depressing its surface tension from 59 dynes, the S. tension of ordinary broth, to 40–45 dynes. By analogy with the floating needle experiment it may be assumed that when the pellicle-forming bacteria are properly wetted they no longer grow upon the surface of the medium but throughout the body of the broth or even at the bottom of the flask.

The further observation has been made that the *B. subtilis* and *B. anthracis*, when grown in media of low S. tension, finally become asporogenous. Cultures of *B. anthracis* grown under such conditions and sterilized by heat at 60° for 30 minutes protect guinea pigs. The enhanced wetting of the bacteria brought about by the addition of soap probably creates better nutritive conditions which cause the organisms to grow without forming spores. Castor oil soap when in aqueous solution is perfectly clear, does

not hydrolyze as readily as most other soaps, and has therefore been used extensively in our experiments. It is more toxic to some bacteria than potassium or sodium stearate. This is probably due to the fact that castor oil soap is dialyzable and probably dialyzes into the cell and disturbs the salt balance by precipitating the calcium, magnesium and salts of the heavy metals.

Bacteria such as the pneumococcus and streptococcus will not grow on low tension media, while the organisms which inhabit the intestinal tract grow abundantly on media of low tension. This is not surprising since the contents of the intestines have a low S. tension due to the presence of bile, soaps and other S. tension depressants. It is well known that many of the intestinal bacteria when inoculated in broth grow near the surface of the medium. This is particularly true of the cholera vibrio. This selective localization is probably due to the fact that the S. tension reducing substances concentrate at the surface of the medium thus creating a favorable environment for these bacteria. Incidentally it may be pointed out that the bacteria which grow well in low tension media are better antigens than the streptococcus, pneumococcus and others which refuse to grow under such conditions.

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A micro-Winkler method for the quantitative determination of dissolved oxygen.

By E. J. LUND.

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Winkler's method for quantitative determination of dissolved oxygen may be applied to 10 c.c. or even 5 c.c. samples of water in the following way. One tenth of a cubic centimeter of each of the two solutions $MnCl_2$ and NaOH − KI are added from 1 c.c. burettes graduated to 0.1 c.c. or less. The thiosulfate solution of the usual concentration is diluted to ten times its volume. The iodine is titrated in a tall dish using a 5 c.c. burette. The end joint is just as definite as that in the ordinary procedure. The percentage error is also the same, about 1 per cent. The distinct