effects of heat than are those the virulence of which is decreased.

This difference in thermal death point amounts to approximately five degrees centigrade with like exposure periods. This difference is the same whether the suspending medium be skimmed milk or 50 per cent rabbit serum in physiological saline. A more complete report will be given at a later date.

ABSTRACTS OF COMMUNICATIONS.

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109 (2341)

A statistical study of the form and growth of Bacterium coli.

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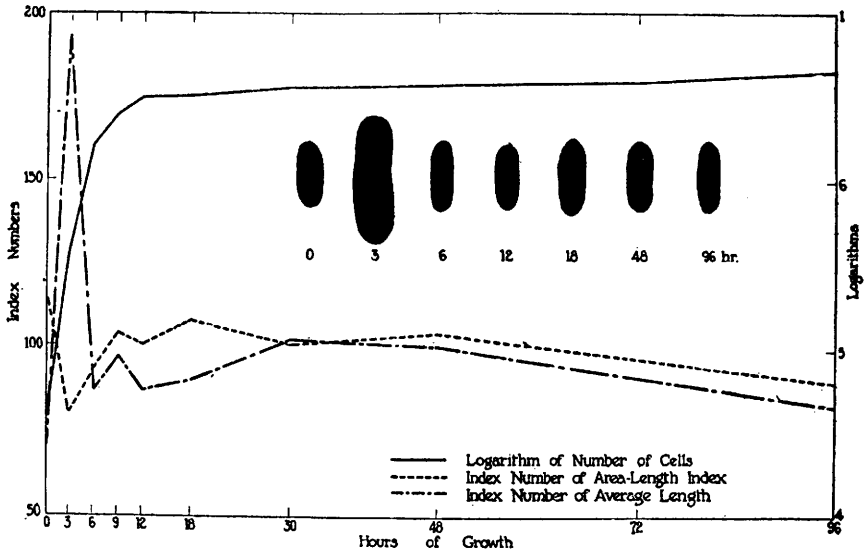
In previous studies[1] of the form and growth of bacteria, the length of the cells has been taken as a measurement of size because apparently the width did not vary nearly so much, and because the width could not be determined accurately with the technique used. In the present study which has had for its purpose the establishment of the normal variations in size and form of *Bacterium coli* when grown on standard beef extract agar, a somewhat different technique was used. Photomicrographs were made from slides prepared by the negative staining method of Benians, and the photographic negatives were again projected so that the final magnification was 30,000 diameters. The projected image was traced on paper and from these tracings the length and area were determined. The growth curve was obtained by counting the cells by a technique which has been previously published.[2]

1 Henrici, A. T., PROC. SOC. EXP. BIOL. AND MED., 1921, xix, 132; 1922, xx, 179.

2 Henrici, A. T., PROC. SOC. EXP. BIOL. AND MED., 1923, xx, 293.



The results are shown in the accompanying graph. The diagrams of the cells have been traced from composite photographs of the tracings of the projected images and indicate roughly the average size and form of the cells at the various time periods. The rate of multiplication is indicated by the curve of the logarithm of the number of cells. Assuming that the cells are symmetrical about the axis, the area of the projected image divided by the length squared may serve as an index of variation in form, just as the weight-length index has been used for higher organisms. The cells were found to vary from spherical to cylindrical types, the area-length index being higher for the spherical forms. The average length of the cells and the average area-length index at each time period have been plotted as index numbers, the index in each case being the general average for the entire series. It will be seen that, like *Bacillus megatherium,* the cells show a marked increase in length followed by a rapid decrease to the original size during the logarithmic growth phase, and then show minor fluctuations. As the cells do not increase in thickness as much as they do in length, they become more cylindrical during the period of increased size, as indicated by a decrease of the area-length index. Frequency curves of the length of cells show marked increased range and dispersion during the period of increased length with some skewness at all periods. No tendency

to bimodality was noticed. The frequency curves of the area-length index, in general, showed skewness in the opposite direction and decreased range during the period of increased size. It would seem then that there is throughout, a negative correlation between the length of the cells and the area-length index. The coefficient of variation for both length of cells and area-length index was increased during the period of increased size.

110 (2342)

On the growth of the human cerebellum in early life.

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All investigators of the ponderal growth of the human cerebellum in early life have been impressed by the rapid rate of increment of this part of the brain in the first year. This has lead certain students of human growth to conclude that the rapid growth of the cerebellum in infancy is correlated with the marked development of muscular co-ordination and activity in this period.

The following figures represent an attempt to test the truth of this concept. They consist of the results derived from the computations of the growth in volume of the cerebellum in the fetal period and of weight in the period of infancy. These computations are based upon the following empirical formulae:

1. For the relation between the cerebellum volume and body-length in the fetal period:

Volume of the cerebellum (cc.) $= 0.01$ [(0.095 crown heel length in cm.)$^{4.9}$ + 20.0], as developed by Dunn.[1]

2. For the relation between body-length and age in the fetal period:

$$\text{Age in fetal months} = 2.3 + \frac{2.5\ (\text{body-length in cm.})}{28} + \frac{(\text{body-length in cm.})^2}{784}$$

as developed by Scammon and Calkins.[2]

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1 Dunn, H., *J. Comp. Neurol.*, 1921, xxxiii, 405.

2 Scammon, R. E., and Calkins, L. A., PROC. SOC. EXP. BIOL. AND MED., 1923, xx, 353.