175 (2407)

Influence of age of parent culture on size of cells of Bacillus megatherium.

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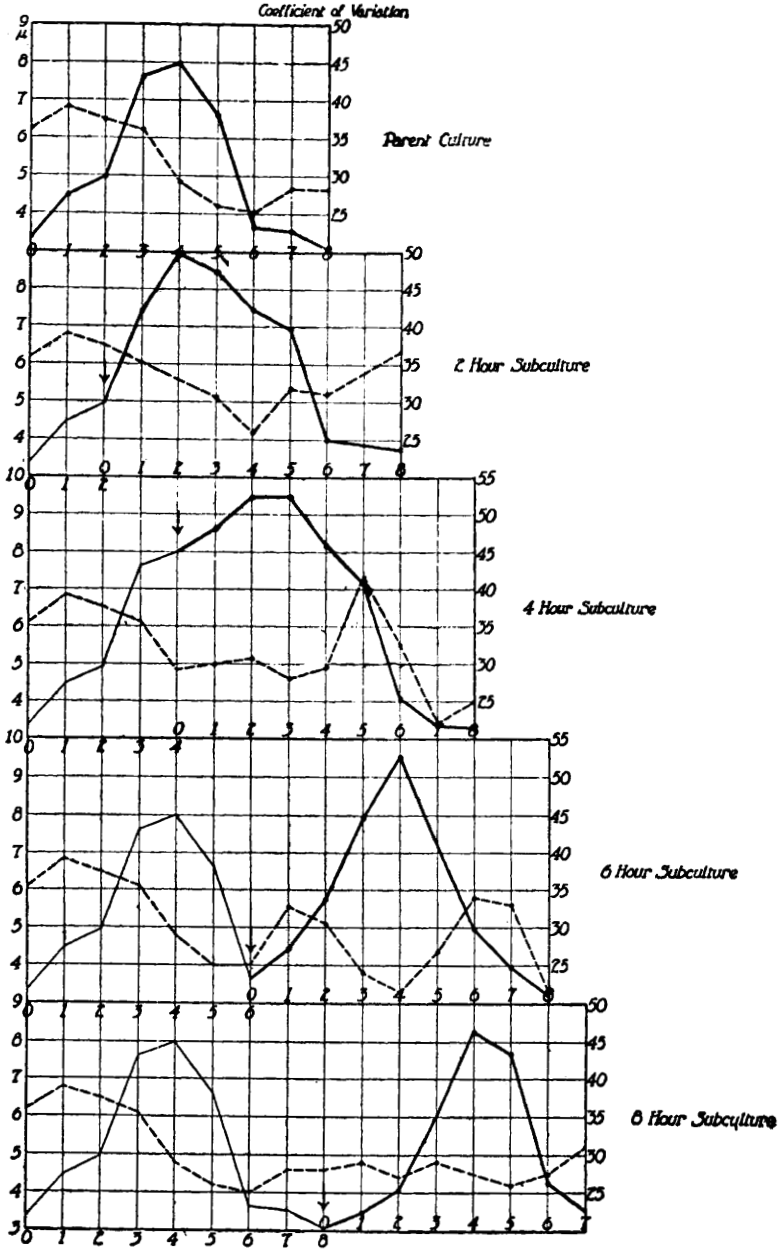
In a previous communication[1] I have pointed out that during the early hours of a culture the cells of *Bacillus megatherium* become greatly increased in size and then rapidly decrease; that the increase in size is accompanied by increased variability, the frequency curves showing skewness and a tendency to bimodality; and that the degree of duration of the increase in size is greater with smaller seedings. These observations were made on cultures inoculated from a culture 12 hours old, *i. e.*, one which had already reached the maximum of growth. In the present study I have observed the variations in size in cultures transplanted from a parent culture after 2, 4, 6 and 8 hours of growth, *i. e.*, during the period when the cells were increasing and decreasing in size.

In the accompanying graphs the solid lines indicate the average length of the cells, the broken lines the coefficient of variation. The abscissæ indicate the age of the cultures in hours, the ordinates to the left length of cells in microns, those to the right coefficients of variation. The curves for the parent culture are repeated in the graphs for the various subcultures up to the time of transplanting.

When transplanted during the period of increasing size, at 2 hours, or at the time of maximum size, at 4 hours, the organisms continued to increase in size. It is noteworthy that the greatest decrease in size in these subcultures occurred between the 5th and 6th hours, as was also the case with the parent culture. The entire curves for these two subcultures, including the time spent in the parent culture, bear the same relationship to the parent culture as do curves obtained from cultures with small inoculums

[1] Henrici, A. T., PROC. SOC. EXP. BIOL. AND MED., 1921, xix, 132.


Coefficient of Variation
Parent Culture
2 Hour Subculture
4 Hour Subculture
6 Hour Subculture
8 Hour Subculture

to cultures more heavily seeded; there is a greater increase in size over a longer period of time.

The cells in the parent culture had practically decreased to the original size in 6 hours. Subcultured at this time they immediately increased rapidly again, reaching a higher maximum than did the parent culture. The eight hour subculture, however, showed an appreciable lag, and the curve is practically a repetition of that for the parent culture.

ABSTRACTS OF COMMUNICATIONS.

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Influence of concentration of nutrients on size of cells of Bacillus megatherium.

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A young spore-free culture of *Bacillus megatherium* was inoculated on slants of standard beef extract agar, and on slants containing the same proportion of agar, but with one-half, one-fourth, one-eighth, and one-sixteenth as much of the nutrient ingredients, beef extract and peptone. The average length of the cells was determined at hourly intervals for eight hours. The results are shown in the accompanying graph. The curves for eighth-strength and sixteenth-strength agar were very similar to that for the quarter-strength, and have been omitted for the sake of clearness.

At the beginning of growth protoplasm is synthesized more rapidly than cell division occurs, and the cells become increasingly larger until a critical point is reached, when the reverse