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.

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

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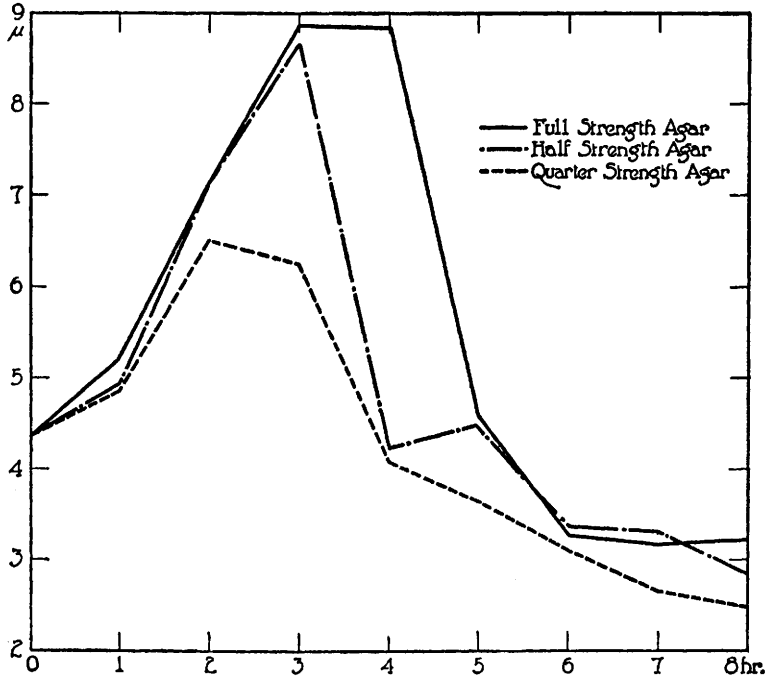
A young spore-free culture of *Bacillus megatherium* was inoculated on slants of standard beef extract agar, and on slants containing the same proportion of agar, but with one-half, one-fourth, one-eighth, and one-sixteenth as much of the nutrient ingredients, beef extract and peptone. The average length 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

conditions obtain and the cells decrease to their original size. I have previously pointed out that this critical point is reached earlier, the maximum size attained being smaller, when the culture is heavily seeded than when small inoculums are used;[1] and that it may be postponed, the cells reaching a larger size, if a portion of the culture is transferred to a new medium before attaining their maximum length.[2] It would appear then that the size of the cells is determined, in part at least, by the density of the population, *i. e.,* the concentration of bacterial substance. But that this is not the sole factor is indicated by the experiment here reported; for there was much less growth in the mediums of lower concentration, yet the maximum length was smaller, and was reached earlier. Reducing the concentration of the nutrients has the same effect on the size-curve as increasing the concentration of bacterial substance, and the form of the curve is therefore determined by the proportion between these two factors.



[1] Henrici, A. T., PROC. SOC. EXP. BIOL. AND MED., 1921, xix, 132.
[2] Henrici, A. T., PROC. SOC. EXP. BIOL. AND MED., 1924, xxi, 343.