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The rate of spore formation in bacteria.

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The rate of spore formation in *Bacillus megatherium* is shown in Fig. 1, in which the logarithms of the number of vegetative cells and the logarithms of the number of spores are plotted. It will be noted that spore formation is initiated at the end of the active growth period.

I have previously shown that the rate of variation in the size of the cells of *Bacillus megatherium* is dependent in part on the size of the inoculum,¹ in part on the concentration of nutrients in the medium.² I have also observed the influence of these factors on the rate of spore germination and spore formation in *Bacillus cohaerens*. Four sets of cultures were inoculated, two of normal strength agar, and two of quarter strength agar. One set of each kind was seeded with a very heavy emulsion, the other with the same suspension diluted 1-50. The culture used for seeding was an old one, composed almost entirely of spores. The curves indicate the percentage of free spores among 200 cells counted at each time period. The time intervals are plotted on a more extended scale during the period of spore germination than during the period of spore formation. Although the beginning of germination was noted in some spores after an hour, no increase in vegetative cells was demonstrable until the third hour.

It is noteworthy that germination proceeded more rapidly in the lightly inoculated culture than in the heavily seeded one; and commenced more rapidly in the dilute medium than in the full strength agar. The process slowed up more rapidly in the former, and spores never completely disappeared in the heavily seeded dilute medium.

Spore formation proceeds more rapidly in the quarter strength medium, and with the heavier inoculation. This is to be expected, since growth will cease earlier under such circumstances. The actual density of the population in the weaker medium is much

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, 345.

less than in the full strength; therefore the concentration of cells alone is not the determining factor in spore formation.

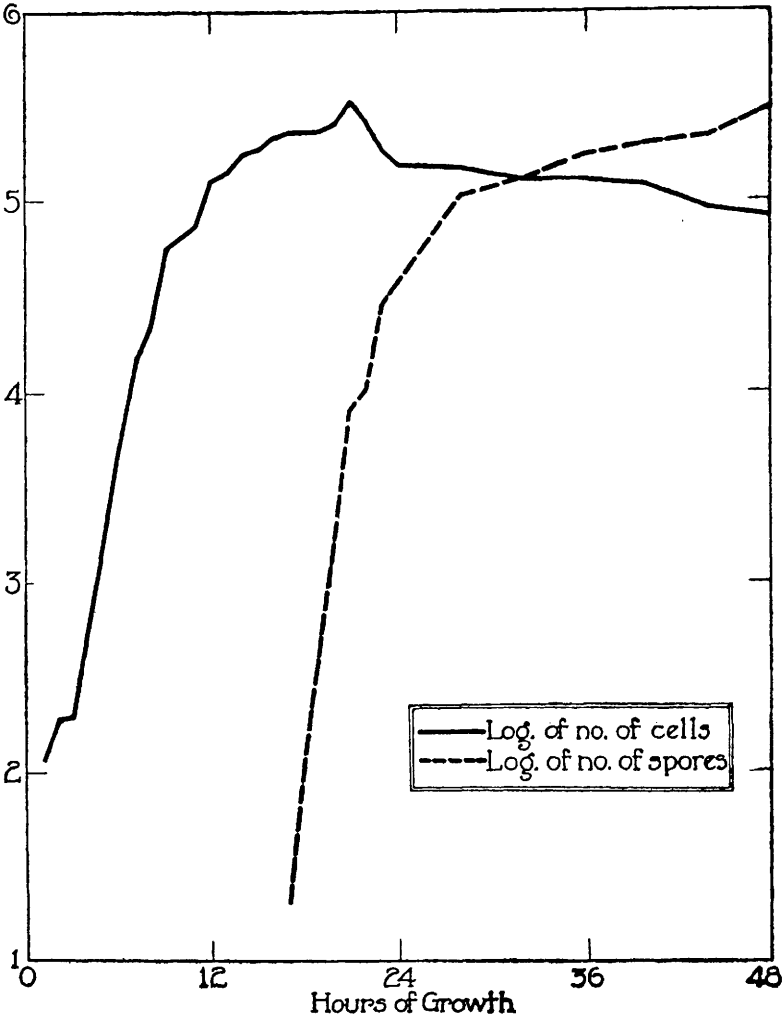
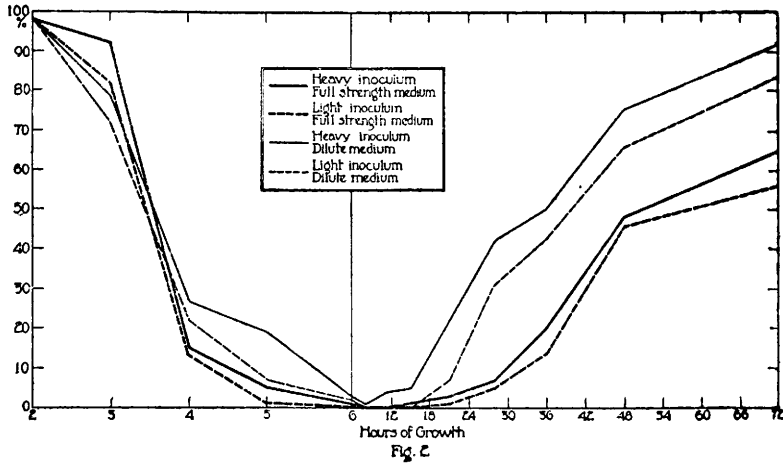


Fig.1



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The action of ammonia upon the lungs.

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A study was made of rabbit and guinea pig lungs, and the effect of prolonged inhalation of ammonia in low concentration. The author used for this purpose a special apparatus, giving in the chamber a constant percentage of ammonia. Concentrations of 1.5, 0.5, 0.25 and 0.15 cc. of gaseous ammonia per liter of the chamber air were used. The experimental animals were kept in this chamber constantly until either death occurred or they were killed for examination. Their temperatures were taken daily, and they were weighed from time to time. Out of