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Effect of Silica on the Growth of the Tubercle Bacillus.*

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In silicosis, silica in some form or in some way seems to increase the pathogenic effects of the tubercle bacillus. It therefore suggested itself that silica might have a stimulating effect on the growth of the tubercle bacillus *in vitro*. Accordingly, I carried out a number of cultural experiments, by adding 1 cc. of sodium silicate or silicic acid, each standardized to contain 1 mg. of the silica used in the preparation per cubic centimeter, to every 100 cc. of Dorset's egg medium, modified by replacing the distilled water by a beef infusion free from added peptone, or sodium chloride, and adjusted to a pH of 7.6.

The results obtained in these preliminary studies have been consistently uniform, and indicated a definite stimulating effect of the added substances, even though the estimated quantity of silica is 0.001 mg. per cc. of medium. This is shown by a lessening of the latent period, and a greater luxuriance of growth. The stimulating effect appeared to be continuous throughout the period of growth. I was thus able to produce readily visible colonies in initial cultures from guinea pigs, and directly from human sources, such as pus, urine and ascitic fluid, in a much shorter time than with other media. In one instance, a primary culture was isolated from ascitic fluid on sodium silicate medium, whereas we failed to obtain any growth on the control tubes of our Dorset's egg medium, with or without glycerine.

Colonies became visible in about 6 days, growth continued rapidly, and could be considered luxuriant within 3 weeks. These observations now cover 20 primary cultures, 17 of which were isolated through guinea pig inoculation, and the remaining 3 directly from human materials.

After I had been successful in demonstrating this stimulating effect on the tubercle bacillus in 6 or 8 primary isolations, I was interested to learn whether this suggested relationship had not previously been tested out. The only reference to such a study was in a verbal communication from Dr. G. J. Cunningham, Director of the Bureau of Industrial Research of the Public Health Laboratories

* This research was carried out under a grant from the National Research Council of Canada.

of Ontario, who attended the Silicosis Conference in Johannesburg, South Africa, in the summer of 1930, and who informed me that Dr. Kettle in a paper read at the conference stated that by replacing the diluent in the egg medium by silicic acid he observed a lessening of the latent period of growth of the tubercle bacillus, but that the effect was merely temporary, the silicic acid having to be replaced at intervals. Since the proceedings have not yet reached me, I am unable to be sure of his actual findings.

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Factors Involved in Male Production by Crowded Moina macrocopa Mothers.

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The writers[1, 2, 3] have extended the earlier observations of Grosvenor and Smith[4] and others on the association between crowding of *Moina macrocopa* mothers and the production of male offspring. We also noted an association between retardation in the time of production of the parthenogenetic young and the percentage of male young produced. Within limits the percentage of male young produced is roughly proportional both to the degree of crowding and to the amount of retardation in the time of their production. Excessive retardation, however, whether induced by crowding or by other treatments, is accompanied by a reduced percentage of male young. We have interpreted this retardation and this male production as due to the accumulation of the mothers' excretory products.

Stuart and Banta[5] have shown that quantity of bacteria available as food for Moina mothers appears, under certain appropriate experimental set-ups, to be the determining factor in sex control in this species. This finding might raise the question as to whether quantity of available food is the principal or sole influential factor involved in male causation in crowding or other experiments, by

[1] Banta and Brown, *Sci. Papers, 2nd Int. Cong. Eugenics*, 1923, **1**, 142.

[2] Banta and Brown, *Physiol. Zool.*, 1929, **2**, 80, 93, 302, 309; 1930, **3**, 48.

[3] Banta and Brown, *Proc. Nat. Acad. Sci.*, 1929, **15**, 71.

[4] Grosvenor and Smith, *Quart. J. Mic. Sci.*, 1913, **48**, 511.

[5] Stuart and Banta, *Anat. Rec.*, 1929, **44**, 210; *Physiol. Zool.*, 1931, **4**, 72.