

transplant after 9 days' exposure to the saturated solution of the dye.

If, instead of saturated solution, 2% solution be used, all 3 organisms will grow vigorously on transplant even after 21 days' exposure, and *B. prodigiosus* and *B. anthracis* will grow well at the end of 35 days' exposure.

Staphylococcus aureus (now known to be highly susceptible to triphenyl methane dyes, like crystal violet) readily survives 24 hours' exposure to saturated aqueous solution of Bismarck Brown (1.2%); and *B. anthracis* (another organism susceptible to triphenyl methanes) put 39 days ago into this solution still grows vigorously when transplanted.

These observations again make clear that the statement sometimes made that a strong aqueous solution of dye stuff is *eo ipso* sterile must undergo considerable modification before it conforms with the facts.

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Resistance of *B. Prodigiosus* to Aniline Dyes.

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B. prodigiosus is known to be one of the organisms which are resistant to triphenyl methane dyes, as well as to other classes of dyes. The experiments here recorded indicate the—perhaps not generally realized—degree of this resistance.

Careful determinations showed that growth of *B. prodigiosus* on agar is prevented by gentian violet* only when the dye is used in dilutions of 1 to 900. Compare this with *B. anthracis* whose growth on agar is completely inhibited by dilutions of approximately 1 to 1,000,000, and whose growth in broth is inhibited even by much weaker dilutions.

This marked resistance of *B. prodigiosus* to the *bacteriostatic* effect is paralleled by its resistance to the *bactericidal* effect of certain triphenyl methane dyes. That the organism (at least the strains of it usually encountered) readily survives exposure to gentian violet

* These experiments were started several years ago and at that time Grüber's gentian violet was being used under the generally held, but mistaken, notion that it was particularly "pure".

for periods of minutes or hours (as contrasted with *Staphylococcus aureus* which is killed by exposures of 45 minutes in 1 to 15,000 solution) is readily shown. Transplants made from a tube containing *B. prodigiosus* suspended in 2% gentian violet showed vigorous growth, though the organisms had been exposed to the dye for 4 hours.

The present report deals, however, with survival of *B. prodigiosus* after exposure to dye for periods of months.

In a preliminary experiment, transplants on agar made from a tube containing gentian violet (1 to 15,000) and *B. prodigiosus* showed the organism to be still alive and vigorous at the end of 14½ months. In another experiment transplants made at the end of 26½ months from a similar tube showed just as vigorous growth of the organism as if no dye whatever had been present.

With acid fuchsin, the results were even more striking. Transplants on agar from a tube containing suspension of *B. prodigiosus* set up nearly 46 months ago still show vigorous growth, though the tubes contain 4 drops of 2% aqueous acid fuchsin to 2 cc. of bacterial suspension.

These results indicate once more that the investigations of recent years have proved entirely too general, statements like those of Michaelis,¹ made years ago and doubtless in accord with the then known facts, that "all dye stuffs are, in high concentrations, bacteria poisons."

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Immunological Studies in Relation to Suprarenal Gland. VII. Effect of Bilateral Suprarenalectomy on Acquired Resistance in Rats.

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In previous studies we gathered evidence of the importance of the suprarenal gland in antibody formation through its influence on the water balance in the tissues of the body.^{1, 2, 3, 4, 5} That the supra-

¹ Michaelis, L., *Einführung in die Farbstoffchemie für Histologen*, 1902, 26.

² Marmorston-Gottesman, J., and Perla, David, *J. Exp. Med.*, 1928, **47**, 713.

³ Perla, David, and Marmorston-Gottesman, J., *J. Exp. Med.*, 1928, **47**, 723.

⁴ Marmorston-Gottesman, J., and Perla, David, *J. Exp. Med.*, 1928, **48**, 225.

⁵ Perla, David, and Marmorston-Gottesman, J., *J. Exp. Med.*, 1929, **50**, 87.

⁶ Marmorston-Gottesman, J., and Perla, David, *J. Exp. Med.*, 1929, **50**, 93.