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Further studies on the potency of botulinus toxin.

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Repeating titration of toxin from day to day, we have observed that determination of the potency of dilutions of toxin in physiological salt solution has often given inconsistent results. Inquiry into the cause of this inconsistency brought out the fact that NaCl, as well as many other salts of mono- and polyvalent metals, have direct deteriorating effect upon toxin. This effect is more marked the higher the dilution at which the toxin is exposed to the salt. At any given concentration of toxin in a salt solution, deterioration is greater the longer the exposure and the higher the concentration of salts.[1] An attempt to neutralize the effect of a single salt by balancing with other salts having antagonistic physiological action yielded no definite result. If, instead of using salt solution, the toxin is diluted in distilled water, the results of titration become more regular, and solutions of toxin keep fairly well. On the other hand, in the presence of a low concentration of salts, addition of serum or broth seems to protect the toxin from deterioration. Moreover, if the toxin is diluted not in salt solution or distilled water but directly in normal horse serum or even in ordinary broth, its potency is increased as compared with that of the same toxin diluted in distilled water.

In view of the tendency of foreign serum to increase the toxic action of botulinus toxin, it is particularly important to determine carefully the type of toxin involved before administering antitoxin. Actual experiments have shown that at least the animals receiving heterologous antitoxin (type B) together with botulinus toxin (type A) die more promptly than the controls receiving the toxin alone.

[1] We are at present immunizing animals with such detoxicated filtrates of cultures of *Bacillus botulinus*.