tality. In equivalent doses, the signs and symptoms appeared earlier and the death occurred quicker with "ultrasonic" toxin than with Gallut's toxin.

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CATALASE ACTIVITY OF *PROTEUS* L FORMS AND NORMAL *PROTEUS* BACTERIA

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It has been shown that normal cells of *Proteus mirabilis* decompose H_2O_2 six to ten times slower than do L forms derived from the same bacterial species (Weibull and Hammarberg, J. Bacteriol. **84**:520, 1962). It was pointed out that this difference in enzymatic activity did not necessarily imply that the L forms studied contained more catalase molecules per mg dry weight than the normal *Proteus* bacteria. It is known that a degradation of the structure of bacterial cells enhances their catalase activity (Herbert and Pinsent, Biochem. J. **43**:193, 1948; Preiss, Arch. Biochem. Biophys. **79**:261, 1959). This effect could explain the observed difference in catalase activity of normal *Proteus* bacteria and *Proteus* L forms, since the L forms probably lyse to a considerable extent when transferred to the medium of low ionic strength used for the catalase assays, whereas normal bacterial cells generally are highly resistant to osmotic forces. To test this hypothesis, the cellular structure of normal cells of *P. mirabilis* was destroyed by grinding the cells with small glass beads in a Mickle disintegrator. Grinding for about 10 min increased the catalase activity of the bacterial suspension approximately eightfold; further treatment in the disintegrator did not cause any additional increase in enzymatic activity. When liquid cultures of the *Proteus* L strains L VI, L 9, L 18, and L D52 were subjected to the same process, only a slight increase in the catalase activity was noted. The same increase, $21 \pm 4\%$ (mean value), was obtained for all four L strains.

When a comparison is made of the results of the experiments described above, and those accounted for in our previous report, it appears that mechanically disintegrated, normal *P. mirabilis* cells exhibit approximately the same catalase activity per mg bacterial dry weight as similarly treated L forms derived from the same bacterium. It therefore seems probable that the conversion of normal *Proteus* bacteria to stable L forms does not radically change the catalase content of the bacterial protoplasm.

It was found (Weibull and Hammarberg, J. Bacteriol. **84**:520, 1962) that the *Proteus* L strain L 9 exhibited a slightly lower catalase activity than strains L VI, L 18, and L D52. It was assumed that this was caused by higher resistance of the first-mentioned strain to osmotic lysis. However, if this were the case, one would expect, after mechanical grinding, a markedly greater increase in the catalase activity of suspensions of this strain in comparison with the other L forms. As already pointed out, such a difference was not noted in the experiments performed in the present study. Therefore, the *Proteus* L strain L 9 probably contains a slightly smaller amount of catalase than strains L VI, L 18, and L D52.

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