



Figure 1.—Regression Line for the Action of Benzoic Acid on White Rats.

observed difference could occur through chance or through an error in sampling only once in twenty times; and the chances are twenty to one that a greater toxicity is to be assigned to the substance whose  $LD_{50}$  is  $m_1$  than to that whose  $LD_{50}$  is  $m_2$ . The application of this formula showed that no significant difference exists between the three values of the  $LD_{50}$  determined for benzoic acid. Likewise was the difference between the  $LD_{50}$  found for benzoic acid and that found for *p*-fluorobenzoic acid shown to be insignificant. On this basis, one is justified only in saying that benzoic acid and *p*-fluorobenzoic acid were found in these experiments to be of the same toxicity even though the absolute value of the weighted mean  $LD_{50}$  of benzoic acid is greater than that of *p*-fluorobenzoic acid. The use of statistical methods is therefore seen to be of great value in the study of the relation of chemical structure and physiological activity from a quantitative standpoint.

#### SUMMARY

The toxicity of benzoic acid when administered as the sodium salt intravenously to white rats corresponds closely to that reported for other animals. The value of the  $LD_{50}$  found in this investigation is  $1.714 \pm 0.124$  Gm./Kg. ( $P = 0.95$ ).

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