

salt and 0.54, 0.63, 0.72 and 0.88 percent phenol, respectively; and on the assumption made, these solutions should be isotoxic each to each. The same numerical results can, of course, be obtained without the graph, by arithmetical interpolation from the experimental results given above.

A large number of determinations were also made with higher concentrations of phenol and of salt; but for the purpose in hand toluene proved a very unsuitable solvent, as the ratio between the concentration of phenol in toluene and that in the aqueous phase increases rapidly with the concentration. The hydrocarbon known as coal-oil, or kerosene, is freer from this objection; Mr. J. S. Laird, and after him Mr. C. G. Fraser made use of it for the determination of equivalent solutions, and Mr. E. I. Fulmer extended the experiments with toluene; the results obtained with the two solvents are in good agreement.

#### **Experiments with Anthrax Spores and with Staphylococcus**

Prof. Mackenzie's first experiments with anthrax and solutions of phenol and salt showed that in general the order of toxicity of the solutions is that of the concentration of their chemically equivalent phenol solutions, and a note to that effect was published.<sup>1</sup> They were continued in 1905-6 under his supervision by Dr. J. S. Lemon, and extended to include experiments with staphylococcus as well. No further work was done with anthrax, and that with staphylococcus was brought to a conclusion by Mr. Laird, working in the chemical laboratory through the winter of 1909-10, and by Mr. Burgess in 1913-14.

The results of these experiments, which are published in detail in the following papers, show that in general the toxicity of the solutions studied, (viz., phenol with various concentrations of sodium chloride, phenol with a fixed concentration of each of ten other salts) is in each case the same as that of the chemically equivalent solution of phenol in water; one or two exceptions were met with that may be

<sup>1</sup> Trans. Roy. Soc. Canada, Sec. III, 51 (1903).