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proportional to their eoneentrations, but failed to draw any general eonelusions.

The next paper on the subject, A. A. Noyes'¹ "Contribution to the Knowledge of the Order of Polymolecular Reactions," contains four series of experiments by W. O. Scott, in which the initial concentrations of potassium bromate and iodide vere varied, while in all the acid was present in constant excess. Comparison of the constants of the second and third order in the different series led to the conclusion that "the reaction between hydriod": and bromie acids is of the second order."

In the following year in a paper "On the Catalytie Effect of Hydrion on Polymolecular Reactions"² Noyes showed from certain of Magnanini's measurements, that the rate of the reaction between hydrobromic and bromic acids is proportional to the square of the concentration of the hydrion.

In spite of this large amount of work, however, the author of the most recent text-book on chemical kinetics³ is of the opinion that ' the course of the oxidation of hydriodic acid by the oxyacids of the halogens appears to be so intricate that a satisfactory application of the mass law has not yet been made." The measurements of the present paper show definitely the influence of the concentration of each reagent on the rate, and the extent to which the results are affected by the presence of the products of oxidation, *viz.*, iodine and bromide.

Plan of the Experiments

In these measurements, in order to trace the effect of the concentrations of each one of the chemicals separately, I have adopted a plan described by Mr. W. C. Bray⁴ under the title "Method of Constant Rates" which consists in choosing the concentrations so that "while the amount or change accomplished in a suitable interval of time is sufficient for the

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¹ Zeit. phys. Chem., 18, 118 (1890).

² Ibid., 19, 599 (1891).

³ J. W Mellor : "Chemical Statics and Dynamics," p. 103 (1904).

⁴ Jour. Phys. Chem., 7, 93 (1903).