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THE RELATIONSHIP BETWEEN ELECTRICAL POTENTIALS AND CHEMICAL REACTIVITY[1]

By Professor LOUIS KAHLENBERG

UNIVERSITY OF WISCONSIN

WE are to-day celebrating the seventy-eighth anniversary of the birth of Edgar Fahs Smith, who was so personally beloved by us all. It is consequently fitting that we pause to dwell upon those phases of our science in which he was specially interested. Though Dr. Smith busied himself with a large number of chemical problems covering a wide field, yet it will commonly be conceded that no work was more dear to him than his electrochemical researches and his studies in the history of the development of chemistry. It would, therefore, seem specially appropriate to consider a topic in these domains, and so I have chosen to invite your attention to the relationship between electrical potentials and chemical reactivity.

[1] Edgar Fahs Smith memorial address delivered at the Chemical Laboratory of the University of Pennsylvania.

The most striking thing about chemical phenomena is the fact that they depend mainly upon the specific nature of the substances that are brought together. Unless the right substances are chosen, no chemical change takes place, no matter what are the conditions of temperature, pressure, concentration or excitations caused by electricity, light or other agencies. The explanation of chemical change has always been the assumption of a specific attraction, that is, an affinity of the substances for one another, an affinity which depends entirely upon the specific nature of the substance studied. Naturally, the desire to measure the intensity of this affinity has occupied chemists quite early in the history of the development of our science. Perhaps the first systematic attempt in this direction was made in the eighteenth century by Torbern Berg-

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