Discussion Group on New Approaches to High School Chemistry

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The Chemical Education Materials Study - Ed Haenisch

An account was given of the current status of this study which began under National Science Foundation support early this year. The steering committee for the study is under the chairmanship of Glen T. Seaborg. J. Arthur Campbell is the director of the study. A rather detailed description of the study is contained in a speech made by Dr. Seaborg on the occasion of the dedication of the American Chemical Society headquarters building in Washington and is reported in CHEMICAL AND ENGINEERING NEWS for October 17, 1960, page 97.

During the summer of 1960 the contributors group of the study completed a trial version of the text and the laboratory manual combination entitled "Chemistry - An Experimental Science". These materials are currently being used in twenty-three high schools located chiefly in the Los Angeles and San Francisco areas in California.

The text assumes that students believe in atoms and molecules, but that they do not understand the reasons behind these beliefs. Introductory chapters present an overview of chemistry in terms of the atomic-molecular nature of substances and develop concepts of behavior in terms of atomic theory and energy changes. The periodic table is introduced as a means of ordering chemical information. The second section deals with some of the most basic concepts of chemistry, again from the experimental point of view. Chapters on energy, rates, equilibrium, acid-base, and oxidation-reduction are tied together in terms of the mole concept, the kinetic theory, and the atomic-molecular concept of behavior in matter. Material designed for the second semester begins with a discussion of atomic and molecular structure and of structural relationships in the various states of matter, together with their influence on chemical reactivity. The chemistry of carbon and of typical elements in the periodic table is studied, particularly as to the trends in properties as one moves through the rows and columns of the table. Emphasis in these sections is on the experimental approach with the intent of utilizing the materials and ideas presented earlier to tie chemical knowledge together.

The materials will be revised on the basis of this year's trial. Summer conferences will be held in 1961 at Cornell University and at Harvey Mudd College, where about 100 more teachers will become familiar with the course for use in their high schools in 1961-1962. Before the material is released for general publication, it will be revised as necessary on the basis of the 2-year trial.

In addition to the text and laboratory material, the study will make movies for high school use and sponsor the writing of monographs, some of which will be tied closely to the text material. Others will be designed to widen the contact of the superior student with chemistry.

Information as to the availability of the materials and further progress of the study may be obtained from the director, Dr. J. A. Campbell, Harvey Mudd College, Claremont, California.

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