SCHOOL SCIENCE AND MATHEMATICS

VOL. XX, No. 8

NOVEMBER, 1920

WHOLE No. 172

RESEARCH IN CHEMISTRY.

Conducted by B. S. Hopkins,

University of Illinois, Urbana.

It will be the object of this department to present each month the very latest results of investigations in the pedagogy of chemistry, to bring to the teacher those new and progressive ideas which will enable him to keep abreast of the times. Suggestions and contributions should be sent to Dr. B. S. Hopkins, University of Illinois, Urbana, Ill.

THE PASSIVE STATE: A REVIEW OF THE THEORIES.

By J. H. REEDY,

University of Illinois, Urbana, Ill.

The fact that certain metals may become inactive, and behave towards chemical reagents as if they were nobler than would be expected from their place in the E. M. F. series, has been known for more than a century. But simple as this fact is, chemists have never been able to explain it in a manner that is wholly satisfactory, and the phenomenon still remains one of the unsolved problems of the science.

Passivity was discovered in the case of iron, and this metal still remains not only one of the most marked, but one of the most baffling examples of this phenomenon. John Kier in 1790 found that iron which had been dipped in fuming nitric acid had lost its normal chemical behavior, such as the displacement of hydrogen from dilute sulfuric acid, and copper from copper sulfate solution; in fact, it behaved as one of the noble metals. Schoenbein called this state of chemical inactivity "passivity." More recently the phenomenon has been found to exist in other metals, notably chromium and nickel.

The lists of metals assuming the passive form as given by various writers are not identical. All include iron, chromium and nickel—the metals which show the phenomenon in its most