

tables based on "physical properties" are radically wrong in principle. Dr. Frazer himself emphasizes in italics the truth that "*Every true mineral is a definite chemical compound or element,*" and it thence follows that every true scheme of determining minerals should start and be based on their *chemical composition*, bringing in physical tests *afterwards* to verify the chemical determination, or to distinguish between the few minerals which contain the same ingredients or respond to the same tests. The Weisbach method starts at the wrong end, and while it may and does give to beginners a superficial acquaintance which enables them to identify the *usual* forms of the *common* minerals, yet it is totally unfit to guide in the accurate determination of minerals in general.

JOSEPH W. RICHARDS.

PHYSICAL LABORATORY MANUAL FOR SECONDARY SCHOOLS. BY CHARLES F. ADAMS, A. M., Teacher of Physics in Detroit Central High School. 12 mo. pp. 184. 1896. New York and Chicago: Werner School Book Company. Price, 75 cents.

While the number of elementary manuals for physical laboratory instruction continues to increase, it is rare to observe among them any decided advance either in methods or plan. In the book before us the author has sought to eliminate qualitative exercises "or illustrative experiments," as he calls them, and to confine the pupil's attention to comparatively few exercises, the greater part of them being quantitative in character. It would seem, however, that, especially in elementary instruction, there is a proper place for qualitative physics as there certainly is for qualitative chemistry. Indeed, in certain parts of the subject, as, for instance, in physical optics and in electrostatics, qualitative experiments are an almost necessary preparation for quantitative ones. A judicious combination of the facts of physics, ascertained by qualitative experiments, with the laws of physics, proved and verified quantitatively, would seem to constitute the best basis for an elementary laboratory text-book. While there is not much that is novel in Mr. Adams' text-book it is well arranged, the experiments are for the most part well chosen, and the descriptions are clear and concise. The emphasis with which care in entering the results in the note-book is insisted on, is particularly to be commended.

G. F. BARKER.