

electrolytic separations. It seems to us that in many cases the author could have substituted, with advantage, the electrolytic processes, which have been proposed by others in recent years.

Professor Herrick's translation is excellent in every respect; while it closely follows the original text, it contains numerous very valuable additions.

H. F. KELLER.

LABORATORY MANUAL AND PRINCIPLES OF CHEMISTRY FOR BEGINNERS.  
BY GEORGE M. RICHARDSON, ASSOCIATE PROFESSOR OF CHEMISTRY IN  
THE LELAND STANFORD JUNIOR UNIVERSITY. pp. 233. New York:  
Macmillan & Co. 1894. Price \$1.10.

This book is, as the author states in his preface, "principally intended as a *laboratory manual*," and the course of experiments "arranged for the elementary students of chemistry in this university." It is in two parts, Part I (pp. 84) consisting of a course of laboratory experiments, and Part II being devoted to theoretical chemistry.

While many of the laboratory experiments contained in Part I are instructive and well adapted for their purpose, and well suited for beginners, there are also many with which fault may be found.

In some instances these experiments involve the use of rather complicated pieces of apparatus requiring an expenditure of the student's time to get together and set up which is out of proportion to the importance of the fact to be taught by the experiment itself; in other instances the time and work required to perform the experiment are in like manner excessive when taken in comparison with the importance of its object.

But a far more serious fault than this lies in the difficulty of most of the quantitative experiments, of which there is a very considerable number, "greater," as the author states, "than is commonly found in such laboratory manuals."

Most of these quantitative experiments are decidedly beyond the ability of the average beginner in chemistry to perform with any degree of accuracy, and some of them can yield accurate results only in skilled hands.

It is far worse than useless to require a student to perform quantitative experiments without also requiring of him accurate results; hence, if quantitative work is to be given to the beginner

at all; in itself a matter of more than doubtful expediency; the experiments given him should be of the simplest kind only, and of such a nature that even in inexperienced hands, fairly accurate results may be obtained.

The requirement from students of quantitative work, the proper performance of which lies beyond their abilities, is almost inevitably followed by one of two consequences—the conscientious student, failing after repeated attempts to obtain correct results from an experiment, is apt to become discouraged, and begins to dislike his work; his less conscientious fellow, tiring of an experiment after he has repeated it once or twice, “cooks” his figures to give the desired result in order to get rid of it. In either case the harm done is great.

In Part II, “the writer has attempted to give a clear and concise statement of some of the fundamental theories and principles of chemistry; here he has gone more into detail than is customary in books designed for elementary students.”

This part is open to a similar criticism. Some of the matter it contains might be read with advantage by a beginner, but it is not in such form as to be readily available, and the consideration of such subjects as Absolute Temperature, The Determination of Molecular and Atomic Weights, The Determination of Formulas, The Kinetic Theory of Gases, etc., can scarcely be undertaken with profit by beginners in chemistry, and is also rather out of place in a book “principally intended as a laboratory manual.”

On the whole, while with some revision the book would be an excellent one to place in the hands of a second-year student, it is hardly one which can be recommended for the use of beginners.

R. D. C.

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#### NOTES.

*International Chemical Congresses.*—The following circular letter has been addressed to the foreign chemical societies:

DEAR SIR:

An International Congress of Chemists, organized in connection with the World's Columbian Exposition, was held at Chicago in August, 1893. The American Chemical Society met