

contrary to those of the author, but none, I think, will fail to find it abounding in information, stimulating and tending to the advancement of the science and art of analysis. L. B. HALL.

QUANTITATIVE CLASSIFICATION OF IGNEOUS ROCKS, BASED ON CHEMICAL AND MINERAL CHARACTERS. BY WHITMAN CROSS, JOSEPH P. IDDINGS, LOUIS V. PIRSSON, HENRY S. WASHINGTON. With an Introductory Review of the Development of Systematic Petrography in the Nineteenth Century, by WHITMAN CROSS. Chicago: The University of Chicago Press. London: William Wesley & Son. 1903. 283 pp.

In this volume have been brought together the two essays under the above titles that appeared in Volume X of the *Journal of Geology* (see abstracts in this Journal, 24, R., 454, and 25, R., 7), with the addition of tables to aid in the calculation of the mineral and chemical compositions of rocks, and with a glossary of the new terms employed in the nomenclature. To adequately review this important work would require much space. It seems, therefore, only necessary to refer to the second of the above-mentioned abstracts, and to quote the following passages from the authors' preface.

"Much of the material will be useful to those, also, who do not follow the new classification, since it has a general application to petrography. Thus the 'Review of the Development of Systematic Petrography in the Nineteenth Century' presents a historical sketch of the subject which is valuable to all students of petrology."

"The methods of calculation by which the minerals of a rock may be reckoned from its chemical analysis, and the reverse process, will become more and more of a requirement in the practice of petrographers, as the demand for quantitative description increases. And the convenience of tables in carrying on the operation will be appreciated by all who undertake the work."

"The glossary will be found useful to those who adopt the new system in defining specifically each new term, particularly the magmatic names which appear for the most part only in the tables of the five classes where it requires some consideration to frame their definitions. Their full value will be appreciated when they are studied in connection with the collection of some thousands of rock analyses made within the past fifteen years, which has been prepared by Henry S. Washington, and will be published shortly."

"It is hoped that the present publication will contribute to the

better understanding of the development of petrography, and to a fuller appreciation of its defects and needs, and will point out a way along which substantial advancement may be made in the future.”

W. F. HILLEBRAND.

ŒUVRES COMPLETES DE J.-C. GALISSARD DE MARIGNAC Tome I 1840-1860 Paris: Masson et Compagnie. Price, by subscription, 25 francs for the two volumes.

This is a beautiful volume of 8 + lv + 701 quarto pages. Fifty-five pages contain a well-balanced and admirable account of the life and scientific labors of the great Swiss chemist, written with affectionate and well-controlled enthusiasm by his son-in-law. Then follow the earlier half of his scientific papers, which appeared before the end of the year 1860. Thirty-eight are memoirs reporting his own work, and twelve are notes commenting on papers of other scientific men which were closely related to subjects treated in his own papers. The order is chronological, and the paging of the original memoirs is reproduced in the margin.

Marignac was born in Geneva in 1817, and was professor of chemistry there from 1841, as well as of mineralogy also from 1845, till failing health put an end to his teaching in 1878. For perhaps five years longer, he was able to accomplish something in a private laboratory at his house; afterwards, till his death in 1894, he retained his full intellectual powers, and endured with fortitude a good deal of suffering.

Four of his papers were undertaken under the direction of Liebig, and belong to organic chemistry. A few relate to mineralogy; Marignac enjoyed pedestrian tours among the Alps, from which he brought back minerals which he loved to investigate. One paper concerns the theory of the famous experiment of Foucault in which the rotation of the earth is demonstrated by the change of the plane of motion of a free pendulum. One concerns the properties of sulphuric acid, and one describes a hydraulic blowing engine used in Westphalia; Marignac was *Ingenieur des Mines*.

The remaining papers of the present volume are all the work of a great chemist of splendid manipulative skill who devoted the best efforts of his life to the determination of atomic weights. Many were the elements for which his results will always be an