

## OUR BOOK SHELF.

*Commercial Cuba. A Book for Business Men.* By William J. Clark. With an Introduction by E. Sherman Gould. Illustrated. Pp. xviii + 514. (London: Chapman and Hall, Ltd., 1899.)

A THOROUGHLY practical book written from the standpoint of the American trader, "Commercial Cuba" lays no claim to either literary or scientific merits. From its own point of view it would be difficult to find anything more exactly adapted to the needs of the moment. From personal experience in Cuba, Mr. Clark is able to advise his countrymen as to the necessity for adapting their ways of living and of dealing to the peculiarities of a tropical West Indian climate and a Spanish-American population of conservative habits.

In speaking of the population, the author points out that there is no danger of Cuba becoming a second Haiti, as statistics show a tendency for the negro element to increase very slowly, if not actually to die out. Practical hints as to the preservation of health in the tropics occupy one chapter, in which the hygienic virtues of coco-nut milk are strongly insisted on. Every aspect of the economic life of Cuba is touched upon in turn, and lists are given of the more important products, with hints as to those which deserve more attention than they have yet received. A detailed account of each province, with a condensed gazetteer giving information as to every town and village, conclude the work.

The report, taken as a whole, amply confirms the general belief as to the extraordinary riches of Cuba, which has continued to flourish under difficulties imposed by population and government which no less favoured land could have endured. When the oppressive laws have been repealed, the way to the waiting markets of the United States thrown open, and a flood of American capital and American enterprise directed to its ports, Cuba promises to become all that its discoverers dared to dream. Hitherto the wealth of the island has lain in the plantation products, and mainly in two crops—tobacco and sugar; but the mineral resources appear to be enormous, and are practically untouched. There exists no adequate survey of the island, either topographical or geological, and the knowledge of the native flora and fauna is still very incomplete.

Mr. Clark, in discussing the labour problem, hazards the opinion that the future working population of Cuba will be largely composed of Italian immigrants, to whom the climate, prevailing religion, and mode of life in the island will prove particularly congenial, while the language will present little difficulty. All these conditions will militate against the immigration of negroes from the Southern States, while the coloured people of the overcrowded islands of the British West Indies are considered by the author to be too poor in physique to be desirable in Cuba.

*The Free Expansion of Gases: Memoirs by Gay-Lussac, Joule, and Joule and Thomson.* Translated and edited by J. S. Ames, Ph.D., Professor of Physics in Johns Hopkins University. Pp. 106. (New York and London: Harper and Brothers, 1898.)

THIS forms the first of a series of handy small volumes containing reprints and translations of classical papers, relating to various branches of physics, which are to be issued under the title of "Harper's Scientific Memoirs." Messrs. Harper are to be congratulated on their enterprise in launching a venture which should at least prove of great service to students, especially to students of the comparatively advanced type. They are also to be congratulated on having secured so well qualified a general editor as Prof. Ames, who is personally responsible for the contents of this first volume. That such a series should be issued at all is a remarkable evidence of the development of physical study and research in

America, for it presupposes a considerable public to whom such papers are matters of sufficient interest to induce a purchase. Each paper is accompanied by a few lines of biography, and is printed in a practically complete form, with the omission only of tabular or illustrative matter which could be spared without serious loss. A few notes, giving corrections or explanations, are added, and the volume is completed by a list of books and articles of reference. In a short preface Prof. Ames draws attention to Gay-Lussac's experiments—the account of which forms the first paper in the volume—as affording a justification of Robert Mayer's assumption that the heat developed in compressing a gas is the equivalent of the work spent, the assumption, namely, on which Mayer's estimate of the mechanical equivalent of heat was founded. But it does not appear that Gay-Lussac's work, even if Mayer was acquainted with it, supplied the *lacuna* in his reasoning, or in any way detracted from the credit due to Joule for his later settlement of the matter.

The bibliography might with advantage have included a reference to the remarkable application, which in recent years has been made by Linde, of the slight cooling effect which a gas suffers in free expansion. The small cooling effect which was discovered by Thomson and Joule, the investigation of which is described in the papers reprinted here, has sufficed in Linde's hands to enable temperatures to be reached which are only a little short of the absolute zero. Incidentally, the work of Linde and Dewar has shown that the effect in hydrogen is a cooling effect, as it is in other gases, and it is to this that the liquefaction of hydrogen by Dewar is due.

J. A. E.

*The New Science and Art of Arithmetic for the Use of Schools.* By A. Sonnenschein and H. A. Nesbitt, M.A. Pp. x + 501. (London: Swan Sonnenschein and Co., Ltd., 1899.)

*A School Arithmetic.* By R. F. Macdonald. Pp. viii + 264. (London: Macmillan and Co., Ltd., 1899.)

MESSRS. Sonnenschein and Nesbitt's volume is a modification of one which appeared in 1870, and has for some years occupied a foremost place among school arithmetics. A number of text-books, in which the principles as well as the practice of arithmetic are treated, are now available; but the changes made by Messrs. Sonnenschein and Nesbitt should enable their work to hold its own among them. Several chapters have been remodelled in order to render the demonstrations easier; a new chapter on the properties of fractions has been introduced; least common multiple is now connected with the Euclid, Book V., and various other additions and alterations have been made to bring the volume up to date in the methods of work described.

A knowledge of the theory of arithmetical operations is essential to the student of mathematics; but ability to accurately work examples is more valuable in ordinary life than a comprehension of the principles involved in the processes employed. The only way to acquire facility in solving problems, or quickness and accuracy in arithmetic, is by steady practice; and abundant material for exercise with these objects in view is provided in Mr. Macdonald's volume. Sufficient information as to methods of working is given to enable the pupils to understand how to apply the various rules, but no attempt has been made to explain the reasons of the processes described, the purpose of the author being to establish and extend the knowledge of pupils who have already had a training in the principles of arithmetic. The volume practically consists of exercises, most of which are in problem form, and many are of the kind met with in everyday life. For students in Schools of Science, and pupils whose arithmetical faculties have become rusty, the book should be found especially suitable.