

that arithmetic should be so often confounded with the vulgar art of logistic—the necessary, but ignoble, reckonings of the exchange and the market-place. Even those who are aware of the distinction often fall into another error, which is almost equally pernicious. To most of them scientific arithmetic means the “Theory of Numbers,” a term which they vaguely associate with an unknown, mysterious branch of mathematics with which only a few eccentric specialists have any concern.

The facts of the case are very different. It is true, of course, that the exact and logical foundation of the very rudiments of arithmetic has required the efforts of a series of the greatest intellects; that in order to follow its numerous ramifications, and appreciate its relation to other parts of analysis, demands a large amount of ability and perseverance; and that many of its truths have, as yet, only been proved by elaborate, one may even say artificial, methods; while other theorems, almost certainly true, still baffle all attempts at demonstration. But, in spite of all this, it may be asserted that arithmetic requires less apparatus and less preliminary training than any other branch of mathematics; and that, whether as a recreation or as a field for research, it amply rewards a very moderate degree of application.

It is not without reason, therefore, that Prof. Cahen addresses himself deliberately to amateur mathematicians; and, in fact, any one gifted with common sense, unspoiled by a vicious course of school instruction, ought to profit by his lucid and entertaining pages. In six chapters he deals in sufficient detail, and with appropriate numerical illustration (a most important point), with the elementary definitions and laws of operation, with linear and quadratic congruences, and with the elementary theory of binary quadratic forms. After this come a series of notes, ranging from scales of notation to an outline of the properties of Gauss's complex integers and their nearest allies; and, finally, a very useful set of tables, which afford the reader material for those applications to particular cases, without which the general theory cannot possibly be mastered.

The appearance of this work, as well as of others with a similar object in view (for instance, M. J. Tannery's excellent “*Leçons d'Arithmétique*”), encourages the hope that some improvement may be effected in the teaching of arithmetic in schools, and that a sound knowledge of its first principles may cease to be the monopoly of a very small minority of University graduates. It is, unfortunately, true that a very large proportion of class-books, both in arithmetic and in algebra, contain half-informed, misleading attempts at expounding theory which are really worse than the old-fashioned bundles of “Rules”; and unless these are replaced by something better, the efforts of reformers will have the lamentable result of producing a state of things worse than the old routine: a mere jargon of pseudo science, a barbarous patchwork of sham “Principles.”

M. Cahen's work will be found of interest, not only by the amateur in search of recreation, but by intelligent teachers and arithmeticians of every degree of proficiency; while the professed devotees of the science will look with pleased anticipation for the more extended work on the same subject which the author appears to be preparing.

G. B. M.

#### OUR BOOK SHELF.

*Atlas of Urinary Sediments, with special reference to their Clinical Significance.* By Dr. Hermann Riedel. Translated by F. C. Moore, M.Sc., M.D. Victoria. Edited and Annotated by Sheridan Delépine, M.B., C.M. Edinburgh, B.Sc. Pp. viii + 111, and 36 plates. (London: C. Griffin and Co., Ltd., 1899.)

THE work before us, as is evident from its title, is an atlas, and will be of interest rather on account of its plates, which are very beautiful, than of its letterpress; this latter, however, which is situated at the end of the book, covers more than a hundred pages, and is provided with a bibliography and an index of authors and subjects. The text is sub-divided into an introduction and two parts. The introduction deals with methods of collection and examination, &c. Part i. is devoted to unorganised, Part ii. to organised sediments. The editor has added considerably to the original text, his remarks being indicated by parentheses: he occasionally differs with Dr. Riedel concerning fact. The large additions to the text made by the editor have rather altered the character of the work, and have probably increased the sphere of its usefulness.

Under organised sediments bacteria are considered. A useful chapter is to be found at the end concerning the making of permanent specimens of urinary sediments.

The book should be of value to urologists, and the plates certainly to physicians in general. The thanks of the profession are due to the translator and the editor for making the work available to English readers, and amplifying its contents.

*Dante.* By Edmund G. Gardner, M.A. “The Temple Primers.” Pp. vi + 159. (Dent, 1900.)

A VERY admirable book, by the author of Dante's “Ten Heavens.” Dante was a master of the science of his time, and Mr. Gardner has shown that he has not only carefully studied the “*Divina Commedia*” from the point of view of literature, but has taken pains to carefully annotate all the references to the then *systema mundi* on which so much of the action of the poem depends. Diagrams and explanations are given at the end of the book, which will be found most useful by the student.

*The Farmstead.* By Prof. J. P. Roberts, Director of the College of Agriculture, Cornell University. Pp. vi + 350. (New York: The Macmillan Company. London: Macmillan and Co., Ltd., 1900.)

THIS is a very readable compendium of suggestions in regard to providing a beautiful, economical, and healthy rural home. Although written for American farmers, it contains much that is of interest to all who are concerned with a country life, and few will peruse the book without gleaning some useful hints. There are special chapters on house-furnishing, decoration, and sanitation by Prof. Mary Roberts Smith, who writes pleasantly on the lighter sides of a farmer's life. A strong case is made out for the educational opportunities of the farm, which are shown to be ample enough to satisfy the most exacting advocate of Nature Study. W. S.

*Object Lessons in Botany from Forest, Field, Wayside and Garden.* Book ii., for Standards iii., iv. and v. By Edward Snelgrove, B.A. Pp. xviii + 297. (London: Jarrold and Sons.)

THIS is a meritorious little book, and ought to well serve its purpose of inculcating habits of accurate and precise observation in the young pupils for whom it is designed. Although we notice a few slips here and there, they are not serious ones, and are quite eclipsed by the excellent character of the book as a whole. The author is convinced, as he says in the preface, of the value of elementary botany in the education of children, and we think his book justifies his contention.