

tion is here opened to the teacher, and the person who will follow its simple and intelligible guidance cannot help profiting greatly by it. The book is marked with evidences of wide philosophical and educational reading; the psychology of the subject of which it treats and the rich and helpful literature in which that subject abounds pedagogically, have heretofore been as good as closed to the average elementary instructor; and if the purpose of the book is destined to fulfil be only that of opening a wider and more cheerful vista to individual teachers, the author has every reason to congratulate himself. No two persons could have written such a work at all alike; myriad divergent influences shape the opinions of even competent individuals on this subject; and the captious and toplofty criticisms which efforts of this character invariably evoke in certain quarters are as groundless as they are ill-humored. The purpose of Dr. Smith's book may be best given in his own words:

"Several years ago the author set about to find something of what the world had done in the way of making and of teaching mathematics, and to know the really valuable literature of the subject. He found, however, no manual to guide his reading, and so the accumulation of a library upon the teaching of the subject was a slow and often discouraging work. This little handbook is intended to help those who care to take a shorter, clearer route, and to know something of these great questions of teaching,—Whence came this subject? Why am I teaching it? How has it been taught? What should I read to prepare for my work?"

The subject is envisaged, thus, in its evolutionary, as well as its logical, aspect. The three topics of arithmetic, algebra, and geometry are severally considered as to their history, their place in education, their typical forms, etc. The traditional methods of presentation are critically examined, and new and more powerful points of view set forth. In this respect the book will be a revelation to many elementary teachers, and the advice which it carries, if heeded, will do much to revolutionise our elementary instruction. It is true that a great deal that is offered here is already accessible to the students of our best Normal Schools and Teachers' Colleges, but it is essential that it be put in permanent form and also brought within the reach of the rank and file of our teachers, who are in sorest need of it. As to the rich bibliography and general references collected in this book, they have an independent value, which renders the possession of the work desirable on this score alone. Perhaps Dr. Smith will add to his second edition some references to the simpler mechanical aids to calculation, the slide-rule, arithmetical machines, etc.; for the analysis of these mechanisms is fraught with educational enlightenment and possesses an intrinsic attraction for students. Nevertheless, as our author remarks, it is impossible to compress an encyclopædia into three hundred pages, and we should doubtless be thankful for what we have, without tendering supererogatory advice.

T. J. McC.

A PSYCHO-PHYSICAL LABORATORY IN THE DEPARTMENT OF THE INTERIOR.

A movement for securing government support for the maintenance of an experimental psychological laboratory has taken promising shape in a Senate amendment to the Sundry Civil Bill, asking "for the establishment in the Department of the Interior of the Psycho-Physical Laboratory; for a salary of the Director of the Laboratory, four thousand five hundred dollars; and for expenses incidental to the collection of sociological, anthropological, abnormal and pathological data,

"including the study of the criminal, pauper, and defective classes, and for the preparation of special reports on results of work and for all necessary printing, sixteen thousand five hundred dollars."

The laboratory is ostensibly not to be put into competition with other psychophysical laboratories in our country, although this is precisely what should be done and something to which no true scientist would object, seeing that competition is the very life of science. Its purpose will be solely to gather sociological, pathological or abnormal data, as found especially in children, and in criminal, pauper and defective classes, and in hospitals. Besides these data it is desired to gather more special data with laboratory instruments of precision and to make such experiments or measurements as are generally considered of value by psycho-physicists and anthropologists.

The laboratory, thus, will be in the nature of a great statistical reservoir from which individual scientists may draw their facts and working material. The enterprise is a commendable one, and, if established, will, we hope, be committed to competent hands and not draw upon itself the criticisms which have been aimed at other government ventures in the patronage of science.

A HISTORY OF ELEMENTARY MATHEMATICS.

The charm which the elucidations of history impart to scientific instruction has long been appreciated, but our consciousness of it has been immeasurably enhanced by the *renaissance* which has taken place in recent years in the study of the history of science. While mathematics was perhaps the first of the sciences to receive attention in this regard, it was one of the latest to incorporate the enlightenment which emanated from this source into its formal instruction. "Dry-as dust" is an epithet which almost connotes fascination as compared with the descriptive adjective one is tempted to apply to the majority of the standard text-books of mathematics formerly in vogue. It was the great original treatises only, like Lagrange's *Theory of Functions*, that were interesting reading in a historic and philosophic regard. The text-books proper seemed to possess a monopoly of making themselves forbidding in aspect and content; and while much has been done to remedy this state of affairs by the addition of historical notes and appendices, it is after all to be admitted that the historical and developmental treatment of mathematics must from the nature of the case be largely relegated to the personal initiative of the teacher. The knowledge in question must in most cases be sought outside the text-books; and it is here that the brief histories of mathematics perform their function.

From the purely human side the most interesting of these in English is Ball's *Short Account of the History of Mathematics*. But neither this work nor the more recent book by Cajori (both are relatively expensive volumes) treats of the great body of mathematical truth as a thing of purely logical and evolutionary growth; their exposition is given rather in connexion with the individual *persons* who have contributed to the development of mathematics, and regarding whom many interesting anecdotes and stories are told. In *Fink's Brief History of Mathematics*, on the other hand, a volume which has been translated from the German by Prof. Wooster Woodruff Beman and Dr. David Eugene Smith, and published during the year just past by The Open Court Publishing Company, a systematic attempt has been made to write a compendium of mathematical history from a purely scientific and evolutionary point of view, eschewing utterly the