

than he knew. Indeed, the researches of Sir William Jones and other Indian archeologists, who were contemporaries to Montucla, and of whose labors he should not have been ignorant, threw considerable doubt on Mahomet Ben Musha's claims. The researches of Mr. Colbrooks have since placed beyond yea or nay that the Hindus in the fifth century, perhaps earlier, were in possession of algebra extending to the general solution of both determinate and indeterminate problems of the first and second degrees, and subsequently advanced to the special solution of biquadratics, wanting the second term, and of cubics in very restricted and easy cases. Priority, therefore, is decisive in favor of both Greeks and Hindus against the Arabs, who were avowed borrowers in science. This question was exciting up to Saturday lively discussion among the learned in Dublin, who have still some leisure from the turmoil of politics to devote to the nicer problems of the infancy of civilization. At one period the erudite wrangling promised to lead to serious results among some gray-haired professors; but a change has come over the scene. Dr. Haughton, like another Neptune, has interposed, and the angry waves are tranquillized. "High algebra," he says, "was taught in Sanskrit books centuries before the birth of the prophet Mahomet—A. D. 568, and, *a fortiori*, long before the Arabian mathematicians of the ninth century." In support of his assertion he cites the authority of Sir John Herschel and Augustus de Morgan. Surely, none will have the hardihood to stand up before such a triumvirate.—*Irish Times*.

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READING.

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II.

Reading, as the basis and instrument of all literary education, is the most important branch of school instruction. After the child has learned to talk, he may be taught to understand, and to give vocal expression to, such written language as is adapted to his degree of mental development. To do this involves an association, in the mind, of the printed form of the word (1) with its proper sound, or pronunciation, and (2) with the idea which it is intended to express. In teaching children to read, the first of these processes requires the principal attention; but, as progress is made, the second constantly increases in importance. The word, and not the letters composing it, is the true element in reading. No one can be said to know how to read who is obliged to stop at the word, and study its composition, before he can pronounce it. The due meaning and pronunciation of every word must be immediately recognized by the mind, without pause or hesitation, in the act of reading. But the word is made up of separate characters, representing elementary sounds; and hence arises a diversity of methods in teaching children to pronounce words. The *alphabet method*, or *A-B-C method* (q. v.), requires that the child should learn the names of all the letters of the alphabet, and then, by means of a spelling process, learn the proper pronunciation of their combinations. This process is condemned by most teachers of the present time, as long and tedious, as well as illogical; the method most generally preferred being that denominated the *word method* (q. v.), by which the child learns at once to pronounce short words, and is taught the sounds and names of the letters, by an analysis of them. When the sounds of the letters are used instead of the names, the process has been called the *phonic method* (q. v.), which, in modern didactics, is most generally approved. Certainly, it is more rational to expect that a child will perceive the true pronunciation of a word through an analysis of the sounds of the letters, than by using their names, many of which afford no key to the sound. For example, if the word be *cat*, the child reaches the pronunciation at once by enumerating the sounds *k a t*; while by spelling, he is obliged to say *c e a t e*, introducing sounds entirely foreign to the word. In the one

case, the mental association required is simple and direct; in the other, it is complex and indirect. It is true that, by long and diligent rote-teaching, children learn to read by the latter method; but the question arises, are they not to a certain extent unfitted for other instruction by so illogical a process? Auxiliary to the *phonic method*, and, indeed, dictated by its needs, is the *phonetic method*, in which the absurd contradictions of the alphabet are removed by using the letters slightly modified, so as to have a character for each separate sound, and each sound represented by one, and only one, character. These various methods are dictated by what may perhaps be called the mechanics of reading; but, in connection with that, the teacher must always bear in mind, that what the child is learning to pronounce is a symbol of thought; and, hence, at every step, the pupil's understanding is to be addressed. "Each sentence read," says Johannot (in *Principles and Practice of Teaching*, N. Y., 1881,) "should be the embodiment of a thought which the pupil thoroughly understands, and should be delivered precisely as it should be spoken. The practice of allowing the words, of a reading-lesson to be pronounced separately should never be permitted." Reading, as a part of education, has a twofold object: (1) to understand what is read; and (2) to give proper oral expression to it; that is to say, reading is either for the purpose of gaining information for one's self, or for imparting information to others. To teach a pupil to read properly implies far more than correct elocution. It implies the development of that judgment and spirit which, being brought to the perusal of useful books, or other reading matter, will enable the student to gather up information, and, in every available manner, make the realm of books tributary to his own mental wants. Hence, as auxiliary to reading, the proper meaning of words, phrases, and idioms must be taught; and exercises must be employed for the purpose of ascertaining to what extent the pupil has received correct ideas from what he has read. When the object is to teach the pupils elocution, the exercises should be specially adapted to that end. Thus, the pupil having read in order to understand for himself, should be required to read the same passage for the information of his fellow pupils. For this purpose, it has been recommended, in class teaching, to permit only the pupil reading to use the book, all the others being required to listen; because, in this way, the pupils will be on the alert to hear and know the meaning of what is read, and will, besides, better appreciate the true end of reading; while, on the other hand, the one reading will endeavor to pronounce correctly, enunciate distinctly, and emphasize naturally. Reading-books should be constructed with a special reference to the accomplishment of this object; and, hence, the lessons should be adapted, at each stage, to the mental status of the pupils. Moreover, the material should not consist of mere fragments, without any logical continuity, but should be of such a character as to discipline the mind in connected thinking upon suitable subjects, and to awaken an interest in the minds of the pupils. Usually, this essential object of reading in schools is defeated by the use of extracts from essays on difficult, abstract subjects, or from authors whose style is too complex, and whose vocabulary is too ponderous for children. Simultaneous reading is commended by some teachers as an elocutionary drill, as being useful (1) to impart habits of distinctness of enunciation, (2) to remove the habit of too rapid or too slow a style of reading, (3) as means of voice culture for elocution.