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THE GREAT EXTENT OF FORESTS in the State of New York, and their devastation, that has been going on continuously, have led to repeated endeavors to protect them from unlawful cutting-down and wasteful practices. For this purpose the New York State Forestry Association was founded in 1885, and did much to get the well-known forestry law passed by the Legislature. Since that time, however, the association has failed to show a vigorous life. At present renewed endeavors are being made to establish the association as a working body for the purpose of disseminating knowledge on the importance of forests, and for promoting measures to secure their proper protection. The New York Academy of Sciences devoted its meeting last Monday to this subject; and the proposed steps, which were explained by Professor Southwick of the New York State Forestry Association, found general indorsement in the discussion following Professor Southwick's remarks. The object is one of great economic importance to the State, and, as Dr. H. Nicholas Jarchow, the first speaker of the evening, remarked, the forests forming a portion of the public domain ought to be a source of considerable income instead of causing expense. He continued, "It would be very advantageous to establish a forestry school in or near the Adirondacks. Its cost would not be large, especially if adjoining States, having much the same climate and varieties of trees, would combine to support a school. Moreover, the labors of the students would nearly pay expenses, and, once graduated, there would be a demand for their services from all parts of the country. Congress has made a national recommendation on the subject; but Congress is slow to act, and the States should provide for themselves in the matter. Trained foresters would take an honest pride in their work, and put their hearts in it. They would save valuable lumber, prevent great thefts of timber, and break up the present state of affairs, with all its disadvantages." Experience has shown that the last act of the Legislature, although a step in the right direction, has not the desired effect: therefore all measures taken for inducing the Legislature to organize a good forestry board, with ample means for carrying on its important work, and attempts to spread an intelligent knowledge of the importance of forests and of their economic value, must be highly welcomed. The New York Academy of Sciences has done well to bring the subject once more before the public, and it is to be hoped that the meeting will be of help to the attempted re-organization of the State Forestry Association.

BOOK-REVIEWS.

A Short Account of the History of Mathematics. By WALTER W. R. BALL. London and New York, Macmillan. 12°. $2.60.

MR. BALL, who is a fellow and assistant tutor of Trinity College, Cambridge, offers in this compact volume a transcript of his lectures delivered in the spring of the present year on the history of mathematics. While technical and exact enough to be of value to the specialist in mathematics as a handy book of reference, it is so clearly and familiarly written, that it is the best work on this subject for the general reader that we know of.

The region of mathematics is a *terra incognita* to most persons, even those who consider themselves possessed of a good general education; and this, despite the fact that mathematics as a mental discipline is unsurpassed, and is unrivalled for the beauty and grandeur of its results. Having for its foundation the two universal and necessary forms of perception, space and time, mathematics developed, naturally enough, in the early stages of reflective thought. To trace the growth of its conceptions in clearness and perspicuity, and to follow up the increasingly complex and varied forms of symbolism, is the work of the history of the science, and Mr. Ball's treatment of it is eminently successful.

After a summary notice of what we may call the prehistoric period of the science, mathematics as understood and taught by the Egyptians and Phœnicians, the author makes a tripartite division of the subject, — mathematics under Greek influence, the mathematics of the middle ages and the renaissance, and modern mathematics. Of the first period, Pythagoras, Euclid, Archimedes, and Ptolemy are the most important representatives. The *quadrivium* of the mediæval schools is traced back to the division of knowledge adopted by the Pythagorians, — numbers absolute, or arithmetic; numbers applied, or music; magnitudes at rest, or geometry; magnitudes in motion, or astronomy. In a chapter on 'Systems of Numeration,' after the prominent names in this first period have been discussed in chronological order, Mr. Ball gives an interesting account of the early methods of counting, and the introduction of the abacus. In his mention of the use of this instrument, we should have been glad to find a more extended notice of the form of it in use among the Chinese, and some further explanation of the very complicated computations which they perform by its aid with great celerity and accuracy.

In the second period, most of the mathematicians were astronomers; but the period includes the introduction of Arabian mathematical works and the results of Arabian thought into Europe. In reference to this, Mr. Ball says, "It was from Spain, and not from Arabia, that Arabian mathematics came into western Europe. The Moors had established their rule in Spain in 747, and by the tenth or eleventh century had attained a high degree of civilization. Though their political relations with the caliphs at Bagdad were somewhat unfriendly, they gave a ready welcome to the works of the great Arabian mathematicians. In this way the Arab transla-