

to tell the pupil that we assume, the truth of such principles as the inertia of matter and the transmissibility of force : build up the whole system of Statics and Dynamics provisionally, and then turn back and explain the foundations upon which such assertions rest, viz. that the more nearly the conditions of these laws are fulfilled the more nearly are their assertions verified ; and that their truth may be considered established conclusively when we compare with observation the results of our system of Physical Astronomy which rests entirely upon the correctness of these principles.

The consideration of these elementary points has detained us so long that we shall have space only very briefly to notice some of the remaining points in Mr. Todhunter's book which appear to deserve attention. The main body of the work is a re-print of Pratt's Treatise, and the proofs are almost everywhere clear and satisfactory. Where Mr. Todhunter has made extensive additions of his own, as in the chapter on the centre of Gravity, they are such as to make us very greatly regret that he did not throw aside Poisson and Pratt, and publish a work of his own. The book as it stands is well adapted to the wants of a student at Cambridge, or at any University where the Cambridge system is followed. It is not adapted, as Mr. Todhunter's other works so emphatically are, to the use of persons reading by themselves, and, which is, in some respects, to be regretted, it does not fit in very well as one of a series of the same author's writings. In Mr. Todhunter's Differential Calculus, he treats the subject entirely by the method of Differential Co-efficients ; he has only a short chapter on Differentials, and even there he studiously avoids the use of infinitesimals. In his Co-ordinate Geometry he is at much pains to adhere to this system, but in the Statics, as might be expected, he is almost compelled to resort to infinitesimals ; and certainly a person whose ideas on the Differential Calculus were entirely derived from Mr. Todhunter's book on that subject would be rather amazed at the boldness with which Differentials are treated in the latter treatise. In some cases this boldness seems to us carried almost to excess. Thus, for example, when he is investigating the conditions of equilibrium of a string stretched over a cylinder, he has to consider the equilibrium of an indefinitely small element of the string,  $PQ$ . This element is kept at rest by the tensions at  $P$  and  $Q$ , and the resistance of the cylinder, *i.e.*, the resultant of the normal reactions at the several points of the element, which, says Mr. Todhunter, is ultimately in the direction of the normal at  $P$ . This is perfectly