

the powers as well as the thoughts of men are "widened with the process of the suns."

Although this dissertation is headed "A General View of Mathematical and Physical Science," into one important branch thereof, namely, the abstract part, or pure mathematics. Professor Forbes has declined to enter. He says—

The mechanical and experimental sciences alone constitute a body of knowledge so large that it is a responsibility sufficient for one person to attempt to grasp them all, and to set forth in order the steps of progress and improvement which have been so rapid and even so startling. Since some of these have scarcely as yet been historically digested, and the broad features of contemporary discovery have not been gradually separated by the judgment of an impartial posterity from those slighter though praiseworthy details, which lapse of time and advance of knowledge will throw into the shadows of distance,—this most laborious task falls principally upon the reviewer. The length and breadth of the subject of natural philosophy, and the cumbrous and scattered depositories of knowledge in which its records must be sought, combine to render not only the undertaking an arduous one, but the result of it a good deal more bulky than might be desired, or than was easily possible, in dealing with the glorious, but compact, history of Newton's age. It might be compared to the difference between writing a history of the Jews or Romans and that of the whole of modern Europe.

The mere magnitude of the undertaking, then, might well excuse me from entering upon the cognate, but exceedingly distinct, subjects of the logic of inductive discovery and the progress of the pure mathematics. But an equally sound reason might be found in my consciousness of inadequacy to undertake, whatever had been the dimensions of my work, a threefold scheme of such magnitude and difficulty. I do not think that any one person could be found to treat the whole as it ought to be treated, and I am certain that I am not that person.

Against such a plea, so urged, nothing can be said, yet it is impossible to help regretting that it should be so. It is true that analysis must always always be subordinate to philosophy, and its very nature is dictated by the requirements of its application to physics; true also that a physical problem has sometimes suggested the general method in analysis which includes its solution as a particular case, and the practical value of a process is proportional to the number and importance of the problems to which it applies; yet we should remember that every epoch of great physical discovery has been immediately preceded by some grand extension of analysis, and that philosophy has too often long lain helpless till the analyst furnished her with the means of moving. Without the algebra of Descartes and Newton's method of series, Newton's *Mechanics* would have been barren of consequences, and without the integral calculus modern science would be reduced to a skeleton. Just as the immense development of our engineering and commercial enterprise was due to the invention of the slide-rest and the improvements of machinery consequent on this; just