velocity, or of the weight into the square of the velocity;—still the examples taken were cases of action in machines and the like terrestrial objects. But Newton's discoveries identified celestial with terrestrial mechanics; and from that time the mechanical problems of the heavens became more important and attractive to mathematicians than the problems about earthly machines. And thus the generalizations of the problems, principles, and methods of the mathematical science of Mechanics from this period are principally those which have reference to the motions of the heavenly bodies: such as the Problem of Three Bodies, the Principles of the Conservation of Areas, and of the Immovable Plane, the Method of Variation of Parameters, and the like (Chap. vi. Sect. 7 and 14). And the same is the case in the more recent progress of that subject, in the hands of Gauss, Bessel, Hansen, and others.

But yet the science of Mechanics as applied to terrestrial machines —*Industrial Mechanics*, as it has been termed—has made some steps which it may be worth while to notice, even in a general history of science. For the most part, all the most general laws of mechanical action being already finally established, in the way which we have had to narrate, the determination of the results and conditions of any combination of materials and movements becomes really a mathematical deduction from known principles. But such deductions may be made much more easy and much more luminous by the establishment of general terms and general propositions suited to their special conditions. Among these I may mention a new abstract term, introduced because a general mechanical principle can be expressed by means of it, which has lately been much employed by the mathematical engineers of France, MM. Poncelet, Navier, Morin, &c. The abstract term is *Travail*, which has been translated *Laboring Force;* and the principle which gives it its value, and makes it useful in the solution of problems, is this;—that the *work done* (in overcoming resistance or producing any other effect) is equal to the *Laboring Force*, by whatever contrivances the force be applied. This is not a new principle, being in fact mathematically equivalent to the conservation of Vis Viva; but it has been employed by the mathematicians of whom I have spoken with a fertility and simplicity which make it the mark of a new school of *The Mechanics of Engineering*.

The Laboring Force expended and the work done have been described by various terms, as *Theoretical Effect* and *Practical Effect*, and the like. The usual term among English engineers for the work