

those powers of practical observation and practical skill were at work, which prepare the way for theoretical views and scientific discoveries.

It may be urged, that the great works of art do virtually take for granted principles of science; and that, therefore, it is unreasonable to deny science to great artists. It may be said, that the grand structures of Cologne, or Amiens, or Canterbury, could not have been erected without a profound knowledge of mechanical principles.

To this we reply, that *such* knowledge is manifestly not of the nature of that which we call *science*. If the beautiful and skilful structures of the middle ages prove that mechanics then existed as a science, mechanics must have existed as a science also among the builders of the Cyclopean walls of Greece and Italy, or of our own Stonehenge; for the masses which are there piled on each other, could not be raised without considerable mechanical skill. But we may go much further. The actions of every man who raises and balances weights, or walks along a pole, take for granted the laws of equilibrium; and even animals constantly avail themselves of such principles. Are these, then, acquainted with mechanics as a science? Again, if actions which are performed by taking advantage of mechanical properties prove a knowledge of the science of mechanics, they must also be allowed to prove a knowledge of the science of geometry, when they proceed on geometrical properties. But the most familiar actions of men and animals proceed upon geometrical truths. The Epicureans held, as Proclus informs us, that even asses knew that two sides of a triangle are greater than the third. And animals may truly be said to have a practical knowledge of this truth; but they have not, therefore, a science of geometry. And in like manner among men, if we consider the matter strictly, a practical assumption of a principle does not imply a speculative knowledge of it.

We may, in another way also, show how inadmissible are the works of the Master Artists of the middle ages into the series of events which mark the advance of Science. The following maxim is applicable to a history, such as we are here endeavoring to write. We are employed in tracing the progress of such general principles as constitute each of the sciences which we are reviewing; and no facts or subordinate truths belong to our scheme, except so far as they lead to or are included in these higher principles; nor are they important to us, any further than as they prove such principles. Now with regard to processes of art like those which we have referred to, namely, the inventions of the middle ages, let us ask, *what* principle each of them