

as besides the purely mechanical movements and their summation, it must contain a reference to the nature of our own faculties—a principle which indicates to what extent the elementary movements come under our control or escape it. There must be a principle which measures the availability and usefulness—for our powers—of natural processes, marking off what is orderly for our senses and accessible to our powers, from what is disorderly and inaccessible. This principle the founders of the science of Thermodynamics—Rankine, Clausius, and Thomson—had empirically established; Thomson having foreseen its far-reaching importance in the economy of nature and the applications of industry. The statistical view of natural phenomena forced upon us by atomism and kinetics has shown us that it is not a purely mechanical¹ principle. It is one belonging to the theory of averages and probability. The scientific view of nature is thus, as Clerk-Maxwell says, neither purely historical nor purely mechanical—it is statistical.²

34.
As opposed
to historical
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ical know-
ledge.

To this view of the scientific treatment of natural phenomena Clerk-Maxwell has attached a further con-

¹ Clerk-Maxwell, in a review of Tait's "Thermodynamics" ('Scientific Papers,' vol. ii. p. 670): "The truth of the second law is therefore a statistical, not a mathematical, truth, for it depends on the fact that the bodies we deal with consist of millions of molecules, and that we never can get hold of single molecules."

² Any one who has had occasion to observe the internal work of any large industrial or manufacturing organisation, will have noticed the twofold way in which important occurrences are looked at by the

commercial and the technical chiefs. As regularity is in many instances the condition of success, any break of its routine is carefully examined and criticised. In such cases the technical man will look to the proximate mechanical causes for an explanation, whereas the commercial man, unable to reflect on the technical and mechanical conditions of the special case, will always refer to his statistics of the past as a guide in judging the immediate difficulty that is before him.