gen applies to each individual molecule, and not merely to the average of groups of millions of molecules." And Clerk-Maxwell goes on to show how the fact that the molecules [1] "all fall into a limited number of classes or species with no intermediate links . . . to connect one species with another by uniform gradation, produces that kind of speculation with which we have become so familiar under the name of theories of evolution, it being quite inapplicable to the case of the molecules. The individuals of each species [2] of molecules are like tuning-forks all tuned to concert pitch, or like watches regulated to solar time." [3]

[1] 'Theory of Heat,' p. 330.

[2] Ibid., p. 331.

[3] The passages quoted from Clerk-Maxwell's writings, and the inferences drawn by him, were criticised by Clifford in a lecture delivered in 1874 with the title, "The First and the Last Catastrophe. A Criticism of some recent Speculations about the Duration of the Universe" (reprinted in 'Lectures and Essays,' vol. i. p. 191 *sqq.*); and, quite recently, Prof. Ward has, in his Gifford lectures, reviewed both Maxwell's and Clifford's arguments ('Naturalism and Agnosticism,' vol. i. p. 99, &c.) As Prof. Ward says, the ideas of Herschel and Clerk-Maxwell "are far more due to theological zeal than to the bare logic of the facts." It is, therefore, out of place to discuss here the philosophical consequences of the ideas of the immutability or of the gradual evolution of the ultimate elements of matter. In a former chapter (see pp. 360 *sqq.* and 369, note, of this volume) I referred to the theories of the evolution of the different chemical elements as they have been put forward by various scientific authorities. The interest which attaches to the passages quoted from Clerk-Maxwell is, that in them, for the first time, an instance was given of the application of statistical methods in the domain of abstract science. The reader may gather from a perusal of the writings mentioned above, as also of the present and foregoing chapters of this history, that there is an inherent contradiction (or as Kant would say, antinomy) between the logical methods and the highest objects of scientific reasoning. The methods all tend in the direction of reducing existing differences in the things and phenomena of nature to a small number of data which are easily grasped and calculated, whereas the observation of things natural forces increasingly upon us the existence of ever greater differences, changes, and varieties. The question presents itself, Is it likely that a process the principle of which is unification and simplification, will ever lead to a comprehension of that which increasingly reveals itself to be infinitely complex and varying? Dr Larmor has some remarks which bear on this subject