

of nature. Towards the end of the last century, and all through the present one, this view of things natural, which I have called the Astronomical view, has exerted a great fascination over scientific minds: especially in the mathematical schools of France and the Continent it has been a leading idea in scientific thought. It has been extended into molar and molecular physics, and has in these led to some very extraordinary and ingenious theories. In England, this astronomical view of Nature has, in the course of the present century, been received

what has been done since Newton in real science will probably convince us that the definition is safe and sufficient. It means the analysis of phenomena as to their appearance in space and their sequence in time. Both can, in consequence of the small number of elementary relations on which arithmetic, geometry, and dynamics are built up, be reduced to—or described in—a small number of elementary terms or conceptions, the alphabet of all science. To show how in every instance the terms of this alphabet are to be put together, in order to correspond to any phenomenon, is all the explanation we can give. Objections have been raised to Kirchhoff's definition by Du Bois-Reymond ("Göthe und kein Ende," in 'Reden,' vol. i. p. 434), inasmuch as it does not define the difference between the descriptive (historical) and the exact (mathematical) sciences of nature; but the difference is really maintained if we demand a complete description. Natural history only affords an incomplete description. The only complete description is that afforded by a mathematical formula in which the constants are supplied by observation. This permits us to calculate those

features or phases of phenomena which are hidden from our observation in space or in time. An objection to the view which identifies physics with mechanics, seems implied in Mach's remarks contained in the last chapter of his very thoughtful book 'Die Mechanik in ihrer Entwicklung' (Leipzig, 1889). According to his view, the aim of exact science is not necessarily to give mechanical explanations or descriptions of phenomena, inasmuch as temperature, electric potential, &c., are just as simple elements of natural phenomena as mass and motion. It seems, nevertheless, that exact measurements are only possible in the data of time and space. Assuming that a complete and simple description—admitting of calculation—is the aim of all exact science, it is evident how much and how little we may expect from science. We shall not expect to find the ultimate and final causes, and science will not teach us to understand nature and life. The search after ultimate causes may perhaps be given up as hopeless; that after the meaning and significance of the things of life will never be abandoned: it is the philosophical or religious problem.