

one side, and Newtonian forces on the other; still more when Fourier, Lamé, and Thomson (Lord Kelvin) pointed to the further analogy which existed between the distribution of temperature in the stationary flow of heat and that of statical electricity on a conductor, and extended the analogy to hydrostatics and hydrodynamics,—it became evident that nature herself pointed here to a mathematical dependence of the highest interest and value. Many eminent thinkers devoted themselves to the study of this subject, but it was reserved for Bernhard Riemann to generalise the mode of reasoning peculiar to these researches into a fundamentally novel method for the explanation and definition of mathematical function or dependence.<sup>1</sup>

<sup>1</sup> Although Riemann's original method of dealing in a general way with algebraical functions is here introduced as a generalisation of certain ideas suggested by mathematical physics, it was not in this way that they were introduced to the mathematical world. This was done in his very abstract and difficult memoir, 'Theorie der Abel'schen Functionen' (published in 1857 in vol. liv. of Crelle's 'Journal'). In this memoir the connection which existed with mathematical physics was not patent, and it took a long time before his methods, which seemed to be a development of Cauchy's earlier researches, were understood and fully appreciated. It was only after he had lectured repeatedly on the subject, and initiated a number of younger mathematicians, who now occupy many of the chairs at the German universities, that the discoveries and inventions of Riemann received their deserved appreciation. Even in his own lectures on mathematical physics—

notably on partial differential equations (including harmonics), and the theory of the potential—he did not lead up to the fundamental ideas which he developed in his lectures on the theory of the Abelian functions. Some light is thrown on the subject of the genesis of Riemann's ideas by his dissertation written in the year 1851, though even the biographical notice attached to the 1st edition of his works (1876) did not deal with the origins of his theory. It seems, therefore, correct to date the adequate recognition of Riemann's work in wider circles from the publication in 1882 of Prof. F. Klein's tract mentioned above. Like several other short treatises of this eminent living mathematician, it must have thrown quite a new light upon the subject; and, like several of his other writings, it revealed connections between regions of thought which to many students must have appeared isolated. "Through the treatment initiated by Klein, the theory of