Fourier's great work on the theory of heat, which for the first time propounded a universal method applicable to the mathematical treatment of almost every physical problem, inasmuch as it, so to speak, follows nature into the marvellous composition of the many movements out of which all her phenomena are compounded, lay buried for fourteen years in the archives of the Institute. That great authority had failed to recognise its paramount importance.[1] Fresnel's first memoir, which established on a firm mathematical basis the undulatory theory of light, was for years left unpublished, whilst the whole scientific world was anxiously expecting the results of his inquiries.[2] In Germany we have examples of similar

12. Fourier.

13. Fresnel.

[1] Jean Bapt. Jos. Fourier (1768-1830), of humble origin, in his celebrated 'Théorie analytique de la Chaleur' (Paris, 1822), and in previous memoirs, carried further the mathematical treatment of physical phenomena and introduced wider conceptions of mathematical quantities and their dependence—*i.e.*, of a mathematical "function." His investigations have led to far-reaching applications in physical science (Ohm and Lord Kelvin), and to profound mathematical theories (Dirichlet, Riemann, &c.) The so-called "Fourier" series has thus a great applied as well as theoretical interest. Fourier's first memoir was presented to the Institute in 1807; an extract was published in 1808; a second memoir was presented in 1811 and crowned, but was not printed till 1824, two years after the great work itself had appeared. On the physical importance of Fourier's analysis see Helmholtz, 'Vorträge und Reden,' vol. i. p. 101, &c.; Sir W. Thomson, Mathematical and Physical Papers, *passim*, but especially vol. ii. p. 41, &c. On the purely mathematical interest that attaches to the Fourier series see especially Riemann, 'Mathematische Werke,' p. 218, &c. A very concise summary of the history of the series is also given by George A. Gibson in the 'Proceedings of the Edinburgh Mathematical Society,' vols. xi. and xii. We shall revert to this subject in a subsequent chapter.

[2] Augustin Fresnel (1788-1827) divides with Thomas Young the merit of having established the undulatory theory of light on a firm basis. His first memoir on Diffraction of Light was presented to the Academy in 1815, a more extensive paper in 1818; this was crowned in 1819, but not printed till 1826. Other papers of his were mislaid or lost. The delay in bringing before the world these important discoveries has been attributed to the opposition of Laplace and his party in the Institute, which even the influence of Arago could not overcome. See what Sir John Herschel says in 1827, referring to Fresnel's memoir of 1821 on