

tute, and had to bear the brunt of the war, in the frequent discussions on the undulatory theory; to which theory Laplace, and other leading members, were so vehemently opposed, that they would not even listen with toleration to the arguments in its favor. I do not know how far influences of this kind might operate in producing the delays which took place in the publication of Fresnel's papers. We have seen that he arrived at the conception of transverse vibrations in 1816, as the true key to the understanding of polarization. In 1817 and 1818, in a memoir read to the Institute, he analysed and explained the perplexing phenomena of quartz, which he ascribed to a *circular polarization*. This memoir had not been printed, nor any extract from it inserted in the scientific journals, in 1822, when he confirmed his views by further experiments.⁴ His remarkable memoir, which solved the extraordinary and capital problem of the connexion of double refraction and crystallization, though written in 1821, was not published till 1827. He appears by this time to have sought other channels of publication. In 1822, he gave,⁵ in the *Annales de Chimie et de Physique*, an explanation of refraction on the principles of the undulatory theory; alleging, as the reason for doing so, that the theory was still little known. And in succeeding years there appeared in the same work, his theory of reflection. His memoir on this subject (*Mémoire sur la Loi des Modifications que la Réflexion imprime à la Lumière Polarisée*), was read to the Academy of Sciences in 1853. But the original paper was mislaid, and, for a time, supposed to be lost; it has since been recovered among the papers of M. Fourier, and printed in the eleventh volume of the *Memoirs of the Academy*.⁶ Some of the speculations to which he refers, as communicated to the Academy, have never yet appeared.⁷

Still Fresnel's labors were, from the first, duly appreciated by some of the most eminent of his countrymen. His *Memoir on Diffraction* was, as we have seen, crowned in 1819: and, in 1822, a Report upon his *Memoir on Double Refraction* was drawn up by a commission consisting of MM. Ampère, Fourier, and Arago. In this report⁸ Fresnel's theory is spoken of as confirmed by the most delicate tests. The reporters add, respecting his "theoretical ideas on the particular kind of undulations which, according to him, constitute light," that "it would be impossible for them to pronounce at present a decided judg-

⁴ Hersch. *Light*, p. 539.

⁵ *Ann. de Chim.* 1822, tom. xxi. p. 235.

⁶ Lloyd. *Report on Optics*, p. 363. (Fourth Rep. of Brit. Ass.)

⁷ *Ib.* p. 316, note.

⁸ *Ann. Chim.* tom. xx. p. 343.