France by Navier and Poisson. One of the greatest analysts of the century, Augustin Cauchy, had likewise applied himself to it; and when Fresnel, in the year 1826, brought out his great memoir on double refraction in crystals, in which he was obliged to enter more closely into the properties of the luminiferous ether and its relation to ponderable matter, Cauchy was induced to devote himself more specially to the mathematical problems which presented themselves. Before his time the theory of elasticity had been studied more as connected with questions of practical engineering, such as the strength of materials, the stability of buildings, the construction of machines, or with the properties of musical and sounding bodies. A new interest was created by Fresnel's researches.[1] The question arose, How are we to describe the vibrations of an imponderable substance, endowed with mass (density) and rigidity, and what conceptions can we form of the change of these vibrations if there is present likewise ponderable matter? Evidently upon the clearness and correctness of these notions depends the explanation of the phenomena observable when rays of light fall upon the surfaces of transparent or opaque bodies. We have to ask: In what terms (viz., of different kinds of motion) can we define and describe, and accordingly calculate the phenonema of reflexion, refraction, scattering (*i.e.*, dispersion), and absorption (*i.e.*, extinction) of light? A tolerably clear

[1] See Verdet in 'Œuvres de Fresnel,' vol. i. p. lxxx: "Les seuls écrits antérieurs à Fresnel où l'on trouve des notions justes sur les inégalités d'élasticité qui peuvent exister dans les corps et sur leur répartition régulière par rapport à certains axes ou plans de symétrie sont ceux du grand minéralogiste allemand Samuel Christian Weis" ('Mém. de l'Acad. de Berlin,' 1815).