of dipolarized colors by MM. Arago and Biot. At the end of the Notice just quoted, Fresnel says,[2] "As soon as my occupations permit me, I propose to employ a pile of prisms similar to that which I have described, in order to study the double refraction of the rays which traverse crystals of quartz in the direction of the axis." He then ventures, without hesitation, to describe beforehand what the phenomena will be. In the *Bulletin des Sciences*[3] for December, 1822, it is stated that experiment had confirmed what he had thus announced.

The phenomena are those which have since been spoken of as *circular polarization;* and the term first occurs in this notice.[4] They are very remarkable, both by their resemblances to, and their differences from, the phenomena of *plane-polarized* light. And the manner in which Fresnel was led to this anticipation of the facts is still more remarkable than the facts themselves. Having ascertained by observation that two differently-polarized rays, totally reflected at the internal surface of glass, suffer different *retardations* of their undulations, he applied the formulæ which he had obtained for the polarizing effect of reflection to this case. But in this case the formulæ expressed an impossibility; yet as algebraical formulæ, even in such cases, have often some meaning, "I interpreted," he says,[5] "in the manner which appeared to me most natural and most probable, what the analysis indicated by this imaginary form;" and by such an interpretation he collected the law of the difference of undulation of the two rays. He was thus able to predict that by two internal reflections in a *rhomb*, or parallelopiped of glass, of a certain form and position, a polarized ray would acquire a circular undulation of its particles; and this constitution of the ray, it appeared, by reasoning further, would show itself by its possessing peculiar properties, partly the same as those of polarized light, and partly different. This extraordinary anticipation was exactly confirmed; and thus the apparently bold and strange guess of the author was fully justified, or at least assented to, even by the most cautious philosophers. "As I cannot appreciate the mathematical evidence for the nature of circular polarization," says Prof. Airy,[6] "I shall mention the experimental evidence on which I receive it." The conception has since been universally adopted.

But Fresnel, having thus obtained circularly-polarized rays, saw

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[2] *Ann. de Chim.* 1822, tom. xx. p. 382.

[3] Ib. *Ann. de Chim.* 1822, tom. xx. p. 191. [4] Ib. p. 194.

[5] *Bullet. des Sc.* 1823, p. 33. [6] *Camb. Trans.* vol. iv. p. 81, 1831.