

of the Sun, but has likewise added considerable weight to the conjectures advanced in reference to the whole physical constitution of the central body of our planetary system. "A ray of light which reaches our eyes, after traversing many millions of miles, from the remotest regions of heaven, announces, as it were of itself, in the polariscope, whether it is reflected or refracted, whether it emanates from a solid, or fluid, or gaseous body, it announces even the degree of its intensity. (*Cosmos*, vol. i., p. 52, and vol. ii., p. 332.) It is essential to distinguish between natural light, as it emanates directly from the Sun, the fixed stars, or flames of gas, and is polarized by reflection from a glass plate at an angle of $35^{\circ} 25'$, and that polarized light which is radiated as such from certain substances (as ignited bodies, whether of a *solid* or *liquid* nature). The polarized light which emanates from the above-named class of bodies very probably proceeds from their interior. As the light thus emanates from a denser body into the surrounding attenuated atmospheric strata, it is refracted on the surface, and in this process a part of the refracted ray is *reflected* back to the interior, and is converted by reflection into polarized light, while the other portion exhibits the properties of light polarized by *refraction*. The chromatic polariscope distinguishes the two by the opposite position of the colored complementary images. Arago has shown, by careful experiments extending beyond the year 1820, that an ignited solid body (for instance, a red-hot iron ball), or a luminous, fused metal, yield only ordinary light, in rays issuing in a perpendicular direction, while the rays which reach our eyes from the margins, under very small angles, are polarized. When this optical instrument, by which the two kinds of light could be distinguished, was applied to gas flames, there was no indication of polarization, however small were the angles at which the rays emanated. If even the light be generated in the interior of gaseous bodies, the length of way does not appear to lessen the number and intensity of the very oblique rays in their passage through the rare media of the gas, nor does their emergence at the surface and their transition into a different medium cause polarization by refraction. Now, since the Sun does not either exhibit any trace of polarization when the light is suffered to reach the polariscope in a very oblique direction, and at small angles from the margin, it follows from this important comparison that the light shining in the Sun can not emanate from the solid solar body, nor from any liquid substance, but must be derived from a *gase-*