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ON RECENT SPECTROSCOPIC OBSERVATIONS OF
THE SUN, AND THE TOTAL ECLIPSES OF 1868
AND 1869.

BY JAMES DOUGLAS, JR.

Astronomy is no longer a purely mathematical science, treating of the distances and magnitudes of the celestial bodies; nor is the telescope the only instrument by means of which the condition of these far-distant worlds can be studied. The spectroscope now enables the astronomer to determine of what the sun and many of the fixed stars are composed; whether they possess an atmosphere, and what elements exist in it; whether they are self-luminous or only reflect borrowed light; what burns in the flaming tail of the comet, and what those mysterious clouds of light—the nebulae—are.

Until the year before last the spectroscope had revealed little else respecting the physical constitution of the sun than that it possesses a gaseous envelope or atmosphere of glowing gases and metallic vapours, in which certain known and many unknown substances existed. But a solar atmosphere had been predicated on other grounds. Looking at the sun in the full blaze of day-light, one sees a fiery orb with sharply-defined circumference; but when the sun is eclipsed, by the passage of the moon between it and the observer, the surface of the sun is seen to be broken,