THE GAZETTE.

WEDNESDAY MORNING, SEPTEMBER 7, 1859.

CAUSE OF THE AURORA BOREALIS.

This is yet an undecided question. Some have ascribed the appearance to solar light refracted in the higher regions of the air, others to the agency of the magnetic fluid.—Euler imagined it to proceed from the same ether which formed the tails of comets; Mairan conceived it to arise from the mixture of the atmosphere of the sun with that of the earth; but when the properties of electric light became known, and when its appearance in rarefied air had been observed, all these hypotheses were by common consent abandoned, and little doubt was entertained that, whatever be the details of the natural process by which it was produced, the aurora borealis was the effect of atmospheric electricity. This is confirmed by the disturbance of the wires of the electric telegraph during auroral displays, which frequently entirely interrupts communication.

Eberhart, Paul Frisi, and others, argued that the aurora is nothing more than electrical discharges transmitted through parts of the upper regions of the atmosphere so rarefied as to produce the peculiar luminous appearance which they exhibit.

M. de la Rive, acting upon a hint given by Morlet, succeeded by an ingenious experiment in producing on a small scale the phenomena of the aurora, by a union of magnetic and voltaic electricity in rarefied air.—Silliman's Journal, commenting upon this experiment, says, it "appears to account very satisfactorily for what passes in the phenomena of the aurora borealis; in fact, the light which results from the union of the two electricities in the part of the atmosphere which covers the polar regions, instead of remaining vaguely distributed, is carried by the action of the terrestrial magnetism round the magnetic pole of the globe, whence it seems to rise in revolving columns, of which it is the base." This theory of the electric and magnetic origin of the aurora is not established beyond dispute. Professor Olmstead, in a paper presented to the American Association at New Haven in 1850, argued in favor of its cosmical origin: first, from the extent of the exhibitions, which is greater than could arise from any terrestrial emanations or atmospheric precipitations. Secondly, from the velocity of the motions, which are too great for any terrestrial forces. Thirdly, from the occurrence of the different stages of an aurora, (the beginning, maximum, and end) at the same hour of the night, in places differing widely in longitude, which indicates that successive portions of the earth, in the diurnal rotation, come under the origin of the aurora situated in space. Finally, from the periodicity of the exhibitions; the diurnal, which shows a relation to the position of the sun with respect to its position; the annual, which indicates a relation of the auroral body to the earth's orbit; and especially the secular, (that is, its occurrence in a series of years and then ceasing for a time) which implies a cycle, at the end of which the auroral body and the earth return to the same relative position in the heavens, while the very existence of such a secular periodicity takes the phenomenon out of the pale of terrestrial, and places it within the pale of astronomical causes. This theory also infers that the auroral body (whence the material of the aurora is derived) is a nebulous body of light, semi-transparent, inflammable and magnetic matter, revolving around the sun; and that probably there are many such collections of nebulous matter diffused through the planetary spaces.—*Boston Journal.*