

duction, to use a conventional mode of expression, passed through the moist earth, we should seem to be justified in concluding that the velocity of the transmission of electricity depends upon the nature as well as the dimensions* of the medium. Bad conductors in the voltaic circuit become more powerfully heated than good conductors; and the experiments lately made by Riess† show that electric discharges are phenomena of a very various and complicated nature. The views prevailing at the present day regarding what is usually termed "connection through the earth" are opposed to the hypothesis of linear, molecular conduction between the extremities of the wires, and to the conjectures of the impediments to conduction, of accumulation, and disruption in a current, since what was formerly regarded as intermediate conduction in the earth is now conjectured to belong exclusively to an equalization or restoration of the electric tension.

Although it appears probable, from the extent of accuracy at present attainable in this kind of observation, that *the constant of aberration*, and, consequently, the velocity of light, is the same for all fixed stars, the question has frequently been mooted whether it be not possible that there are luminous cosmical bodies whose light does not reach us, in consequence of the particles of air being turned back by the force of gravitation exercised by the enormous masses of these bodies. The theory of emission gives a scientific form to these imaginative speculations.‡ I here only refer

* See Poggendorff's *Annalen*, bd. lxxiii., 1848, s. 337, and Pouillet, *Comptes Rendus*, t. xxx., p. 501.

† Riess, in Poggendorff's *Ann.*, bd. 78, s. 433. On the non-conduction of the intermediate earth, see the important experiments of Guillemin, *Sur le courant dans une pile isolée et sans communication entre les pôles* in the *Comptes Rendus*, t. xxix., p. 521. "Quand on remplace un fil par la terre, dans les télégraphes électriques, la terre sert plutôt de réservoir commun, que de moyen d'union entre les deux extrémités du fil." "When the earth is substituted for half the circuit in the electric telegraph, it serves rather as a common reservoir than as a means of connection between the two extremities of the wire."

‡ Mädler, *Astr.*, s. 380; also Laplace, according to Moigno, *Répertoire d'Optique Moderne*, 1847, t. i., p. 72: "Selon la théorie de l'émission on croit pouvoir démontrer que si le diamètre d'une étoile fixe serait 250 fois plus grand que celui du soleil, sa densité restant la même, l'attraction exercée à sa surface détruirait la quantité de mouvement, de la molécule lumineuse émise, de sorte qu'elle serait invisible à de grandes distances." "It seems demonstrable by the theory of emission that if the diameter of a fixed star be 250 times greater than that of the sun—its density remaining the same—the attraction exercised on the surface