of different parts of the soil. In calm air, whether dry or mingled with vesicular vapours equally distributed, sound-waves are propagated without difficulty. But when the air is crossed in every direction by small currents of hotter air, the sonorous undulation is divided into two undulations where the density of the medium changes abruptly; partial echoes are formed that weaken the sound, because one of the streams comes back upon itself; and those divisions of undulations take place of which M. Poisson has developed the theory with great sagacity.* It is not therefore the movement of the particles of air from below to above in the ascending current, or the small oblique currents that we consider as opposing by a shock the propagation of the sonorous undulations. A shock given to the surface of a liquid will form circles around the centre of percussion, even when the liquid is agitated. Several kinds of undulations may cross each other in water, as in air, without being disturbed in their propagation: little movements may, as it were, ride over each other, and the real cause of the less intensity of sound during the day appears to be the interruption of homogeneity in the elastic medium. During the day there is a sudden interruption of density wherever small streamlets of air of a high temperature rise over parts of the soil unequally heated. The sonorous undulations are divided, as the rays of light are refracted and form the mirage wherever strata of air of unequal density are contiguous. The propagation of sound is altered when a stratum of hydrogen gas is made to rise in a tube closed at one end above a stratum of atmospheric air; and M. Biot has well explained, by the interposition of bubbles of carbonic acid gas, why a glass filled with champagne is not sonorous so long as that gas is evolved, and passing through the strata of the liquid.

In support of these ideas, I might almost rest on the authority of an ancient philosopher, whom the moderns do not esteem in proportion to his merits, though the most distinguished zoologists have long rendered ample justice to the sagacity of his observations. "Why," says Aristotle in his curious book of *Problems*, "why is sound better heard

* Annales de Chimie, tom. vii, p. 293.