

medium has a great effect in obstructing and stifling sound, and consequently sounds are conducted with more facility at night than when the sun is above the horizon.

The great distance at which sounds have been sometimes heard is very remarkable, and probably chiefly depends on the state of the atmosphere. Lieutenant Foster states that he has conversed with a man across the harbour of Port Bowen, in the North Sea, at the distance of a mile and a quarter. Guns fired at Carlscroon were, according to Derham, heard across the southern extremity of Sweden as far as Denmark. But the most remarkable instance with which we are acquainted is that recorded by Sir Stamford Raffles, who informs us that the noise which attended the great eruption of Tomboro, in 1815, was heard at Sumatra, a distance of 970 miles.

Many experiments have been made, at various times, and in different parts of the world, upon the velocity of sound in air. The early experimenters, however, are all more or less inaccurate, for want of instruments sufficiently correct to measure the time that elapsed between the flash being seen and the sound being heard. Another cause of error was inattention to the influence of the wind, for which they seldom allowed, although it is quite evident that sound must be transmitted with a diminished velocity when the wind is blowing in a contrary direction to that in which the sound was heard; and when the wind is blowing in the same direction its velocity must be increased.

The modern experimenters have avoided both these sources of error; for, possessing accurate instruments, they have either chosen a time when the air was at rest, or have caused the sound to be transmitted in a direction at right angles to that of the wind.

But the chief difficulty is to ascertain the exact measure of the interval of time between the flash and the report. The most accurate experiments that have been made are those of Moll and Vanbeck, in 1822, and those of the French academicians in the same year. In the experiments made by the Dutch, a clock was used, so constructed that its index could be at any time stopped without stopping the machinery. By this instrument time could be measured to the one hundredth part of a second. The French used a watch of a very ingenious construction. It was furnished with two hands