

cover those parts of it that were thus affected by the earthquake with black crape, we shall obtain a more distinct idea of the extent of surface shaken, than a mere verbal description can convey. This appears to have been one of the most severe shocks that the old continent had experienced for several centuries. The cause which could effect a simultaneous concussion over such a vast extent, must probably have been seated nearly midway between the centre of the globe and its surface.

It has been remarked, that in general, earthquakes are more severely felt in mountainous than in low countries: this might be expected from the structure of the earth.* In alpine districts, the primary mountains are not pressed with the incumbent mass of secondary rocks; and, consequently, in such situations, the resistance to a force acting from beneath will be much less, as all the weight of secondary rock is removed. In very violent earthquakes, the secondary strata are broken or agitated; but proofs are not wanting, of lesser vibrations being stopped by their pressure. Humboldt says, he has seen workmen hasten from the mines of Marienburgh, in Saxony, alarmed by agitations of the earth that were not felt at the surface. During the earthquake at Lisbon, the miners in Derbyshire felt the rocks move, and heard noises which were scarcely perceived by those above. That an expansive force, acting from beneath, is the proximate cause of earthquakes, can scarcely be denied; and the prodigious power of steam, when suddenly generated, seems equal to their production, if the quantity be sufficiently great. It is said, that a single drop of water falling into a furnace of melted copper, will blow up the whole building. This may be an exaggerated statement: but the prodigious force of steam at high temperatures is well known, and there can be no difficulty in admitting, that if a current of subterranean water were to find access to a mass of lava many miles in extent, and most intensely heated, it would produce an earthquake more or less violent, in proportion to the quantity of steam generated, and its distance from the surface. When the hydrogen gas exploded in a mine near Workington, in Cumberland, a shock like that of an earthquake was felt by ships in the river, at two miles' distance.

The horrid crash, like the rattling of carriages, which precedes earthquakes, may be occasioned by the rending of the rocks, or parting of the strata through which the confined vapour is forcing a passage.

All the phenomena that accompany earthquakes indicate the intense operation of elastic vapour, expanding and endeavouring to escape where the least resistance is presented, and producing vibra-

* See a paper on Earthquakes, by the Rev. Mr. Mitchell, Philosophical Transactions, 1759.