

of mud, accompanied with a disagreeable stench. The air is generally calm, but the cattle discover much alarm, and seem to be, instinctively, aware of approaching calamity. A deep rumbling noise, like that of carriages over a rough pavement—a rushing sound like wind—or a tremendous explosion like the discharge of artillery,—immediately precede the shock, which, suddenly, heaves the ground upwards, or tosses it, from side to side, with violent and successive vibrations. The shock seldom lasts longer than a minute; but it is frequently succeeded by others of greater or less violence, which, for a considerable time, continue to agitate the surface of the earth. During these shocks, large chasms and openings are made in the ground, through which smoke and flames are seen to issue: these sometimes break out where no chasms can be perceived. More frequently, stones, or torrents of water, are ejected from these openings. In violent earthquakes, the chasms are so extensive, that large cities have, in a moment, sunk down and for ever disappeared, leaving a lake of water in the place. Such was the fate of Euphemia in Calabria, in 1638, as described by Kircher, who was approaching the place, when the agitation of the ocean obliged him to land at Lopizicum. “Here,” says he, “scenes of ruin every where appeared around me: but my attention was quickly turned from more remote to contiguous danger, by a deep rumbling sound, which every moment grew louder. The place where we stood shook most dreadfully. After some time, the violent paroxysm ceasing, I stood up, and turning my eyes to look for Euphemia, saw only a frightful black cloud. We waited till it had passed away, when nothing but a dismal and putrid lake was to be seen where the city once stood.”

The extent to which earthquakes produce sensible effects on the waters of springs and lakes in distant parts of the world, is truly remarkable. During the earthquake of Lisbon, in 1775, almost all the springs and lakes in Britain, and every part of Europe, were violently agitated, many of them throwing up mud and sand, and emitting a foetid odour. On the morning of the earthquake, the hot springs at Toplitz, in Bohemia, suddenly ceased for a minute to flow, and then burst forth with prodigious violence, throwing up turbid water, the temperature of which was higher than before; it is said to have continued so, ever since. The hot wells at Bristol were coloured red, and rendered unfit for use, for some months afterwards. Even the distant waters of Lake Ontario*, in North America, were violently agitated at the time. These phenomena offer proofs of subterranean communications under a large portion of the globe; they also indicate, that a great quantity of gas or elastic vapour was, suddenly, generated and endeavouring to escape. From the foetid odour

* It has been observed during many earthquakes in the Eastern States, that the subterranean noise and motion appeared to commence from the Lakes, and proceed towards the Atlantic Ocean, in a direction from the north-west.