

on the progress of knowledge in Europe. The germ of a great number of physical truths is found in the works of the sixteenth century; and that germ would have fructified, had it not been crushed by fanaticism and superstition. We learned, at Pasto, that the column of black and thick smoke, which, in 1797, issued for several months from the volcano near that shore, disappeared at the very hour, when, sixty leagues to the south, the towns of Riobamba, Hambato, and Tacunga were destroyed by an enormous shock. In the interior of a burning crater, near those hillocks formed by ejections of scoriæ and ashes, the motion of the ground is felt several seconds before each partial eruption takes place. We observed this phenomenon at Vesuvius in 1805, while the mountain threw out incandescent scoriæ; we were witnesses of it in 1802, on the brink of the immense crater of Pichincha, from which, nevertheless, at that time, clouds of sulphureous acid vapours only issued.

Everything in earthquakes seems to indicate the action of elastic fluids seeking an outlet to diffuse themselves in the atmosphere. Often, on the coasts of the Pacific, the action is almost instantaneously communicated from Chile to the gulf of Guayaquil, a distance of six hundred leagues; and, what is very remarkable, the shocks appear to be the stronger in proportion as the country is distant from burning volcanoes. The granitic mountains of Calabria, covered with very recent breccias, the calcareous chain of the Apennines, the country of Pignerol, the coasts of Portugal and Greece, those of Peru and Terra Firma, afford striking proofs of this fact. The globe, it may be said, is agitated with the greater force, in proportion as the surface has a smaller number of funnels communicating with the caverns of the interior. At Naples and at Messina, at the foot of Cotopaxi and of Tunguragua, earthquakes are dreaded only when vapours and flames do not issue from the craters. In the kingdom of Quito, the great catastrophe of Riobamba led several well-informed persons to think that that country would be less frequently disturbed, if the subterranean fire should break the porphyritic dome of Chimborazo; and if that colossal mountain should become a burning volcano. At all times analogous facts have led to the same hypotheses. The Greeks, who, like ourselves, attributed the oscillations