

be formed far beyond the base of the mountain. The volcano of Sangay, in Ecuador, for instance, has buried the country around it to a depth of 4000 feet under its ashes.<sup>63</sup> In such loose deposits are entombed trees and other kinds of vegetation, together with the bodies of animals, as well as the works of man. In some cases, where the layer of volcanic dust is thin, it may merely add to the height of the soil, without sensibly interfering with the vegetation. But it has been observed at Santorin that though this is true in dry weather, the fall of rain with the dust at once acts detrimentally. On the 3d of June, 1866, the vines were there withered up, as if they had been burned, along the track of the smoke cloud.<sup>64</sup> By the gradual accumulation of volcanic ashes, new geological formations arise which, in their component materials, not only bear witness to the volcanic eruptions that produced them, but preserve a record of the land-surfaces over which they spread. In the third place, besides the distance to which the fragments may be hurled by volcanic explosions, or to which they may be diffused by the ordinary aerial movements, we have to take into account the vast spaces across which the finer dust is sometimes borne by upper air-currents. In the instance already cited, ashes from Coseguina fell 700 miles away, having been carried all that long distance by a high counter-current of air, moving apparently at the rate of about seven miles an hour in an opposite direction to that of the wind which blew at the surface. By the Sumbawa eruption, also referred to above, the sea west of Sumatra was covered with a layer of ashes two feet thick. On several occasions ashes from the Icelandic volcanoes have fallen so thickly between the Orkney

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<sup>63</sup> D. Forbes, *Geol. Mag.* vii. 320.

<sup>64</sup> Fouqué, "Santorin," p. 81.