

characteristics of such streams, namely, that of becoming solid externally, even while yet in motion. Instead of thinning out gradually at their edges, their sides may often be compared to two rocky walls, which are sometimes inclined at an angle of between thirty and forty degrees. When such streams are turned from their course by a projecting rock, they move right onwards in a new direction; and in the valley of Calanna a considerable space has thus been left between the steep sides of the lavas, *b b*, so deflected, and the precipitous escarpment of Zocolaro, A, which bounds the plain C.

*Lavas and Breccias.*—In regard to the volcanic masses which are intersected by dikes in the Val del Bove, they consist in great part of greystone lavas, of an intermediate character between basalt and trachyte, and partly of porphyritic lava, resembling trachyte, but to which that name cannot, according to Von Buch and G. Rose, be in strictness applied, because the felspar belongs to the variety called Labradorite. There is great similarity in the composition of the ancient and modern lavas of Etna, both consisting of felspar, augite, olivine, and titaniferous iron. The alternating breccias are made up of scorix, sand, and angular blocks of lava. Many of these fragments may have been thrown out by volcanic explosions, which, falling on the hardened surface of moving lava-currents, may have been carried to a considerable distance. It may also happen that when lava advances very slowly, in the manner of the flow of 1819, the angular masses resulting from the frequent breaking of the mass, as it rolls over upon itself, may produce these breccias. It is at least certain that the upper portion of the lava-currents of 1811 and 1819 now consist of angular masses to the depth of many yards. D'Aubuisson has compared the surface of one of the ancient lavas of Auvergne to that of a river suddenly frozen over by the stoppage of immense fragments of drift-ice, a description perfectly applicable to these modern Etnean flows. The thickness of the separate beds of conglomerate or breccia which are seen in the same vertical section is often extremely different, varying from 3 to nearly 50 feet, as I observed in the hill of Calanna.

*Flood produced by the melting of snow by lava.*—It is possible that some of the breccias or conglomerates may be referred to aqueous causes, as great floods occasionally sweep down the flanks of Etna, when eruptions take place in winter, and when the snows are melted by lava. It is true that running water in general exerts no power on Etna, the rain which falls being immediately imbibed by the porous lavas; so that, vast as is the extent of the mountain, it feeds only a few small rivulets, and these, even, are dry throughout the greater portion of the year. The enormous rounded boulders, therefore, of felspar-porphry and basalt, a line of which can be traced from the sea, from near Giardini, by Mascali, and Zafarana, to the "Val del Bove," would offer a perplexing problem to the geologist, if history had not preserved the memorials of a tremendous flood which happened in this district in the year 1755. It appears that two streams of lava flowed in that year, on the 2d of March, from the