sions which give rise to the prismatic structure are at right angles to the cooling surfaces.

Newer Pliocene Period—Val di Noto.—I have already alluded (see p. 156) to the igneous rocks which are associated with a great marine formation of limestone, sand, and marl, in the southern part of Sicily, as at Vizzini and other places. In this formation, which was shown to belong to the Newer Pliocene period, large beds of oysters and corals repose upon lava, and are unaltered at the point of contact. In other places we find dikes of igneous rock intersecting the fossiliferous beds, and converting the clays into siliceous schist, the laminæ being contorted and shivered into innumerable fragments at the junction, as near the town of Vizzini.

The volcanic formations of the Val di Noto usually consist of the most ordinary variety of basalt, with or without olivine. The rock is sometimes compact, often very vesicular. The vesicles are occasionally empty, both in dikes and currents, and are in some localities filled with calcareous spar, arragonite, and zeolites. The structure is, in some places, spheroidal; in others, though rarely, columnar. I found dikes of amygdaloid, wacké, and prismatic basalt, intersecting the limestone at the bottom of the hollow called Gozzo degli Martiri, below Melilli.

Dikes.—Dikes of vesicular and amygdaloidal lava are also seen traversing marine tuff or peperino, west of Palagonia, some of the pores of the lava being empty, while others are filled with carbonate of lime.

Fig. 664.

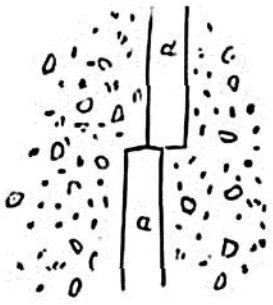

Fig. 665.

Ground-plan of dikes near Palagonia.

a. Lava.

b. Peperino, consisting of volcanic sand, mixed with fragments of lava and limestone.

In such cases, we may suppose the peperino to have resulted from showers of volcanic sand and scoriæ, together with fragments of limestone, thrown out by a submarine explosion, similar to that which gave rise to Graham Island in 1831. When the mass was, to a certain degree, consolidated, it may have been rent open, so that the lava ascended through fissures, the walls of which were perfectly even and parallel. After the melted matter that filled the rent in fig. 664, had cooled down, it must have been fractured and shifted horizontally by a lateral movement.

In the second figure (fig. 665), the lava has more the appearance of a vein which forced its way through the peperino. It is highly probable