

veloped near the margins; (*d*) vesicular or amygdaloidal, lines of minute vesicles having been formed parallel with the walls, and attaining their greatest number and size along the centre of the dike.

As a rule, the outer parts of a dike of crystalline rock, like the upper and under surfaces of an intrusive sheet, are finer grained than the centre. Occasionally, the external surface has a vitreous structure. Basalt veins, for example, have not infrequently an external coating or crust of glass (tachylite, hyalomelan, etc.). It occasionally happens also that the central portions of a basalt or andesite dike are glassy, of which structure several cases have been observed in Scotland; perhaps in these instances the dike has opened along its centre, and a fresh uprise of more glassy material has risen in the fissure.³²

Effects on Contiguous Rocks.—These are similar to the changes produced by intrusive sheets and other eruptive masses. Induration is the most frequent kind of alteration. Remarkable examples have been observed where limestones in contact with dikes have had a saccharoid crystallization of the calcite superinduced upon them, and where even new crystalline silicates have been developed (pp. 545, 998).³³

§ 4. Necks

Under this term are included the filled-up pipes or funnels of former volcanic vents. Every series of volcanic sheets poured out at the surface must have been connected either with fissures, or with orifices probably opened in lines of fissures. On the cessation of the eruptions, these orifices

³² See Proc. Roy. Phys. Soc. Edin. vol. v. 1880, p. 241.

³³ On the Mechanism of Dikes see Mallet, Q. J. Geol. Soc. xxxii. 1876, p. 472.