among such projectile material, unless water has aided in the deposition. Projectile work throws out *angular* fragments broken off from the rocks that adjoin the vent. If the vent ascends through non-volcanic rocks, fragments of these rocks may be distributed along with comminuted igneous material, but they could hardly be a predominant part of the mass.

2. *Rocks.* — The rocks of non-volcanic outflows are the same in kinds with those of volcanic origin. The more scoriaceous lavas are usually absent, but vesicular kinds are common. The moisture producing vesiculation, and sometimes a general hydrous condition of the rock, may be either that of the deep-seated igneous source, or that of waters taken in on the way to the surface; for the latter method of receiving moisture, — that by molecular absorption, if a principle in volcanic phenomena (page 278), will be as much so in non-volcanic. Among the ejections of a system of fissures, those that have come up through sedimentary strata may, or may not, be rendered hydrous, while those intersecting impervious metamorphic rocks are generally anhydrous, with no trace of vesiculation. Owing to such subterranean sources of moisture, igneous rocks are sometimes hydrous throughout, and consequently feeble in luster and wanting in durability. In a similar way, the ascending melted rock sometimes gathers in bituminous materials from carbonaceous shales, and puts them into the vesicles.

Igneous rocks are sometimes divided into those of deep-seated origin related in character to granite, syenyte, and the like (called *plutonic* first by Lyell), and other *igneous* rocks and lavas. But it is a false distinction; for granite is no more of deep-seated origin than other igneous kinds.

3. *The ejections, making dikes and surficial streams.* — The ejected rock may fill a fissure, or but partly fill it. On the other hand, it may flow out of a fissure in a stream over the surface of the country, covering the exposed rocks or soil. The part of the flow within the fissure is a *dike*, whether there is an outflow or not. Fig. 219, on page 262, represents a dike with a surficial stream.

(*a*) *Dikes.* — Dikes vary in width from an inch or two to 300 feet or more, and in position from vertical to horizontal, and, as already explained, are usually, unless quite small, transversely columnar. The smallest are branches from a larger; for an inch-thick stream could not flow far between cold rocks. They often have irregularities and interruptions which are due to a faulting of the rocks intersected subsequent to their formation, and others owing to a shifting of the position of the walls of the fissure before it became filled. But, further, there may be, before the filling, a tumbling in of one wall, or the other, of the fissure, especially when the fissure is much inclined and the intersected rock a weak one.

On the following map, two trap dikes, of the region near New Haven, Conn., are represented (inclosed by dotted lines), which are divided into short parts, owing to the caving in of the overhanging wall.

The Pine Rock dike consists of four such parts (A,B,CC,D), and Mill Rock of three (AA,BB, to "Peak" and C). The inclination of the dike of