and insensibly to pass into ordinary non-volcanic sediment. Hence we may expect to find transitional varieties between rocks formed directly from the results of volcanic explosion and ordinary sedimentary deposits.

Volcanic Conglomerate—a rock composed mainly or entirely of rounded or sub-angular fragments, chiefly or wholly of volcanic rocks, in a paste of the same materials, usually exhibiting a stratified arrangement, and often found intercalated between successive sheets of lava. Conglomerates of this kind may have been formed by the accumulation of rounded materials ejected from volcanic vents; or as the result of the aqueous erosion of previously solidified lavas, or by a combination of both these processes. Well-rounded and smoothed stones almost certainly indicate long-continued water-action, rather than trituration in a volcanic vent. In the Western Territories of the United States vast tracts of country are covered with masses of such conglomerate, sometimes 2000 feet thick. Captain Dutton has shown that similar deposits are in course of formation there now, merely by the influence of disintegration upon exposed lavas.'[124]

Volcanic conglomerates receive different names according to the nature of the component fragments; thus we have *basalt-conglomerates*, where these fragments are wholly or mainly of basalt, *trachyte-conglomerates*, *porphyrite-conglomerates*, *phonolite-conglomerates*, etc.

Volcanic Breccia resembles Volcanic Conglomerate, except that the stones are angular. This angularity indicates an absence of aqueous erosion, and, under the circumstances in which it is found, usually points to immediately adjacent volcanic explosions. There is a great variety of breccias, as *basalt-breccia*, *diabase-breccia*, etc.

Volcanic Agglomerate—a tumultuous assemblage of blocks of all sizes up to masses several yards in diameter, met with in the "necks" or pipes of old volcanic orifices. The stones and paste are commonly of one or more volcanic rocks, such as felsite, porphyrite or basalt, but they include also fragments of the surrounding rocks, whatever these may be, through which the volcanic orifice has been drilled. As a rule, agglomerate is devoid of stratification; but sometimes it includes portions which have a more or less distinct arrangement into beds of coarser and finer detritus, often placed on end, or inclined in different directions at high angles, as described in Book IV. Part VII. Sect. i. § 4.

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[124] "High Plateaus of Utah," p. 77.