

a comparatively small number of the rocks classed here are not true volcanic ejections.<sup>123</sup>

Referring to the account of volcanic action in Book III. Part I. Sect. i., we may here merely define the use of the names by which the different kinds of ejected volcanic materials are known.

**Volcanic Blocks**—angular, sub-angular, round, or irregularly-shaped masses of lava, several feet in diameter, sometimes of uniform texture throughout, as if they were large fragments dislodged by explosion from a previously consolidated rock, sometimes compact in the interior and cellular or slaggy outside.

**Bombs**—round, elliptical, or discoidal pieces of lava from a few inches up to one or more feet in diameter. They are frequently cellular internally, while the outer parts are fine-grained. Occasionally they consist of a mere shell of lava with a hollow interior like a bombshell, or of a casing of lava inclosing a fragment of rock. Their mode of origin is explained in Book III. Part I. Sect. i. § 1.

**Lapilli (rapilli)**—ejected fragments of lava, round, angular, or indefinite in shape, varying in size from a pea to a walnut. Their mineralogical composition depends upon that of the lava from which they have been thrown up. Usually they are porous or finely vesicular in texture.

**Volcanic Sand, Volcanic Ash**—the finer detritus erupted from volcanic orifices, consisting partly of rounded and angular fragments up to about the size of a pea derived from the explosion of lava within eruptive vents, partly of vast quantities of microlites and crystals of some of the minerals of the lava. The finest dust is in a state of extremely minute subdivision. When examined under the microscope, it is sometimes found to consist not only of minute crystals and microlites, but of volcanic glass, which may be observed adhering to the microlites or crystals round which it flowed when still part of the fluid lava. The presence of minutely cellular fragments is characteristic of most volcanic fragmental rocks, and this structure may commonly be observed in the microscopic fragments and filaments of glass.

When these various materials are allowed to accumulate, they become consolidated and receive distinctive names. In cases where they fall into the sea or into lakes, they are liable at the outer margin of their area to be mingled with,

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<sup>123</sup> For a classification of tuffs and tuffaceous deposits see E. Reyer, *Jahrb. K. K. Geol. Reichsanst.* xxxi. (1881), p. 57.