

ascertained to be divisible into—1st, derived fragments, of which the most abundant are quartz, after which come felspar, mica, iron-ores, zircon, rutile, apatite, tourmaline, garnet, sphene, augite, hornblende, fragments of various rocks, and clastic dust; 2d, constituents which have been deposited between the particles, and which in many cases serve as the cementing material of the rock. Among the more important of these are silicic acid in the form of quartz, chalcedony and opal; carbonates of lime, iron or magnesia; hæmatite, limonite; pyrite and glauconite.¹¹⁰

Cliff-Debris, Moraine Stuff—angular rubbish disengaged by frost and ordinary atmospheric waste from cliffs, crags, and steep slopes. It slides down the declivities of hilly regions, and accumulates at their base, until washed away by rain or by brooks. It forms talus-slopes of as much as 40°, though for short distances, if the blocks are large, the general angle of slope may be much steeper. It naturally depends for its composition upon the nature of the solid rocks from which it is derived. Where cliff-débris falls upon and is borne along by glaciers it is called "Moraine-stuff," which may be deposited near its source, or may be transported for many miles on the surface of the ice (p. 714).

Perched Blocks, Erratic Blocks—large masses of rock, often as big as a house, which have been transported by glacier-ice, and have been lodged in a prominent position in glacier valleys or have been scattered over hills and plains. An examination of their mineralogical character leads to the identification of their source, and, consequently, to the path taken by the transporting ice. (See Book III. Part II. Section ii. § 5.)

Rain-wash—a loam or earth which accumulates on the lower parts of slopes or at their base, and is due to the gradual descent of the finer particles of disintegrated rocks by the transporting action of rain. Brick-earth is the name given in the southeast of England to thick masses of such loam, which is extensively used for making bricks.

Soil—the product of the subaerial decomposition of rocks and of the decay of plants and animals. Primarily the character of the soil is determined by that of the subsoil, of which indeed it is merely a further disintegration. Ac-

¹¹⁰ G. Klemm, *Zeitsch. Deutsch. Geol. Ges.* xxxiv. (1882), p. 771. H. C. Sorby, *Quart. Journ. Geol. Soc.* xxxvi. (1880). J. A. Phillips, *op. cit.* xxxvii. (1881), p. 6