

of crushing and deformation of the grains may often be observed, likewise proof of the transfusion of a siliceous cement among the particles. This cement was probably produced by the solvent action of heated water upon the quartz grains, which seem to shade off into each other, or into the intervening silica. It is owing, no doubt, to the purely siliceous character of the grains that the blending of these with the surrounding cement is so intimate as often to give the rock an almost flinty homogeneous texture. That quartzite, as here described, is an original sedimentary rock, and not a chemical deposit, is shown not only by its granular texture, but by the exact resemblance of all its leading features to ordinary sandstone—false-bedding, alternation of coarser and finer layers, worm-burrows, and fucoid-casts. The lustrous fracture that distinguishes this rock from sandstone is due to the exceedingly firm cohesion of the component grains, which break across rather than separate, and to the consequent production of innumerable minute clear vitreous surfaces of quartz. A sandstone, on the other hand, has its grains so loosely coherent that when the rock is broken the fracture passes between them, and the new surface obtained presents innumerable dull rounded grains.

Besides occurring in alternation with schists, quartzite is also met with locally as an altered form of sandstone, which, when traversed by igneous dikes, is indurated for a distance of a few inches or feet from the intrusive mass. These local productions of quartzite show the characteristic lustrous fracture, and have not yet been distinguished by the microscope from the quartz-rock of wide metamorphic regions. There is yet another condition under which this rock, or one of analogous structure, may be seen. Highly silicated bands, having a lustrous aspect, fine grain, and great hardness, occur among the unaltered shales and other strata of the Carboniferous system. In such cases the supposition of any general metamorphism being inadmissible, we may infer either that these quartzose bands have been indurated, for example, by the passage through them of thermal silicated water, or that they are an original formation.

Schistose Conglomerate Rocks.—In some regions of schists, not only bands of quartzite occur, representing former sandstones, but also pebbly or conglomeratic bands, in which pebbles of quartz and other materials from less than an inch to more than a foot in diameter are imbedded in a foliated matrix, which may be phyllite, mica-schist, gneiss, quart-