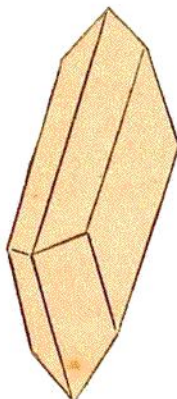


nominated rocks; *e. g.*, quartz, carbonate of lime, etc., but in general,

Fig. 51.



from two to four of them are united to form a rock; *e. g.*, quartz, feldspar and mica, to form granite. In some instances the simple minerals are so much ground down, previously to their consolidation, as to make the rock appear homogenous; *e. g.*, shale and clay slate.

Water constitutes a part of nearly all rocks, either chemically combined with the component minerals, or as a mechanical constituent of the rock itself. The latter is the more usual case. The more common hydrated minerals are talc, chlorite, gypsum, serpentine, diallage, and the zeolites. It is remarkable that the latter, occurring in volcanic or igneous rocks almost exclusively, should contain so much water, while many that are formed in sedimentary rocks have none.

GEOLOGICAL SITUATION OF USEFUL ROCKS AND MINERALS.

The rocks and minerals useful in an economical point of view are in a few instances found in almost every part of the rock series: but in a majority of cases they are confined to one or more places in that series.

EXAMPLES.—*Granite, Syenite, and Porphyry*: found intruded among all the stratified rocks as high in the series as the Tertiary strata; but they are almost entirely confined to the Hypozoic rocks.

Greenstone and Basalt are found among and overlying all the Hypozoic and fossiliferous rocks; but they are mostly connected with the latter.

Lava, some varieties of which, as *Peperino*, are employed in the arts, being the product of modern volcanos, is found occasionally overlying every rock in the series.

Clay: the common varieties used for bricks, earthen ware, pipes, etc., occur almost exclusively in the Tertiary and Alluvial strata. Porcelain clay results from the decomposition of granite, and is found in connection with that rock.

Marl, or a mixture of carbonate of lime and clay, is chiefly confined to the Alluvial and Tertiary strata; and differs from many varieties of limestone, only in not being consolidated.

Limestone, from which every variety of marble, one variety of alabaster, and every sort of quicklime are obtained, is found in almost every rock, stratified and unstratified. In the oldest stratified rocks and in the unstratified it is highly crystalline; and in the newer strata (*e. g.*, chalk), it is often not at all crystalline. The most esteemed marbles are obtained from the Palæozoic rocks, either unaltered or metamorphic.

Serpentine is connected with metamorphic rocks, either Hypozoic or Palæozoic. It is not unfrequently associated with trap rocks in later periods.

Gypsum, or Plaster of Paris, is found in Europe in all the Mesozoic and