

split, the fresh surfaces are either flat, or uneven in very different degrees.

The flat surfaces are referred to this head of cleavage, and the uneven ones to fracture.

Other faces parallel to the flat surfaces thus exposed may generally be discovered by splitting, or, as it is termed, cleaving the mineral in the corresponding directions.

The faces which may thus be developed by cleavage are of two kinds; one consisting of layers of thin crystals, which are separated at their surfaces, but which admit of no farther division or cleavage between such surfaces; the other consisting of planes which may be produced at indefinitely small distances from each other, and apparently belong to the structure of the mineral itself. The first of these kinds will be termed *faces of union*, and the second *cleavage planes*.

The faces of union are generally found in one direction only; but the cleavage planes usually occur in two or more directions, and frequently in such as to produce a crystalline solid; and if the mineral occurs in regular crystals, the cleavage planes will generally be parallel to some of their faces. When the specimen is sufficiently large, it may be rested on a small steel anvil, and be split with a small chisel and a light hammer; when less, a pair of pincers with parallel cutting edges may be used; and sometimes a knife may be sufficient to detect the cleavage planes in a small crystal, which, for this purpose, must be firmly held between the forefinger and thumb.

Cleavage planes assist in determining the crystalline form of the mineral under examination, and by which its species may frequently be known; they will also generally afford more exact angular measurements than can be obtained from the natural faces of the crystals.

The variety of pyroxene named sahlite affords an instance of faces of union, and galena and calcite examples of cleavage planes in three directions. We include under the head of cleavage the separation of the thin leaves of mica, sulphate of lime, and other minerals of similar structure.

#### STRUCTURE.

235. This term is used to express the manner in which the separate parts of minerals are aggregated together, as far as it can be ascertained by mechanical disruption of the mass.

The varieties of structure are

*Crystalline*, where the broken surfaces present the cleavage planes referred to in the preceding section.

*Laminar*, where the mass admits of easy separation into indefinitely thin plates in only one direction, as in mica.