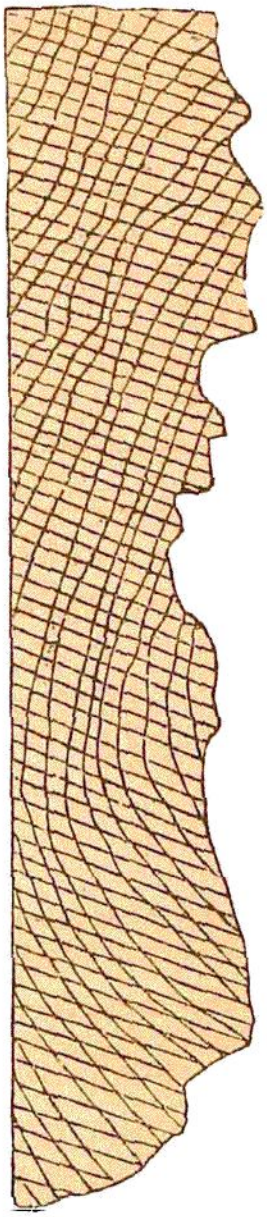
and but rarely crossed by other planes as joints are. Roofing slate is a good example.

We venture to doubt, however, whether the indefinitely thin plates, generally regarded as an essential property of cleavage, are always present. For we have not unfrequently met in quartz rock and in some siliceous slates with parallel divisions, which could not properly be referred to joints or stratification, where the plates could not be split thinner than half an inch, and often not so thin; and if not cleavage, we can give them no name. May we not omit thinness of the plates in our definition of cleavage, and still not confound cleavage with joints?

Fig. 18.

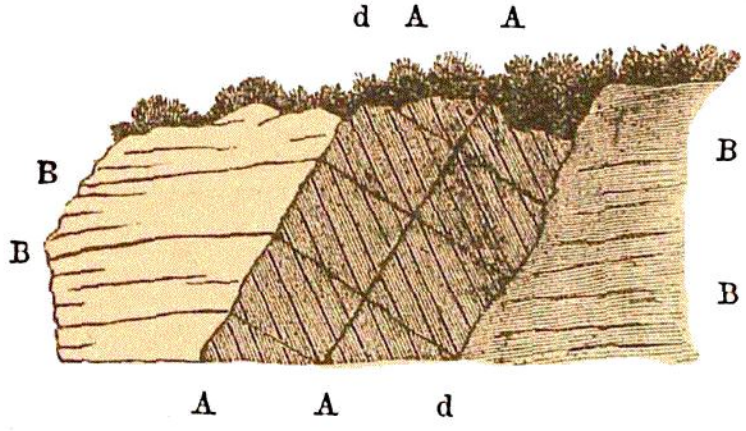


The cleavage planes may be inclined to the planes of stratification at any angle from 0° to 90°, and sometimes the two planes dip in opposite directions. The cleavage planes are remarkable for their almost perfect parallelism, while strata, laminæ and folia are often contorted.

Fig. 13 represents cleavage planes, *bb*, crossing irregular strata, *aa*.

In Fig. 14 are represented the planes of stratification, B B, B B; the joints A A, A A; and the slaty cleavage, *dd*.

Fig. 14.



Foliation.—A change in metamorphic rocks analogous to cleavage is called *foliation*. It is *a crystalline lamination*, or a separation of the different mineralogical compounds into distinct layers, much resembling strata. In districts where these crystalline rocks have not been much disturbed, the foliation coincides with the stratification. In regions much corrugated or disturbed the foliation often intersects the strata at a considerable angle, like cleavage planes. In fact,