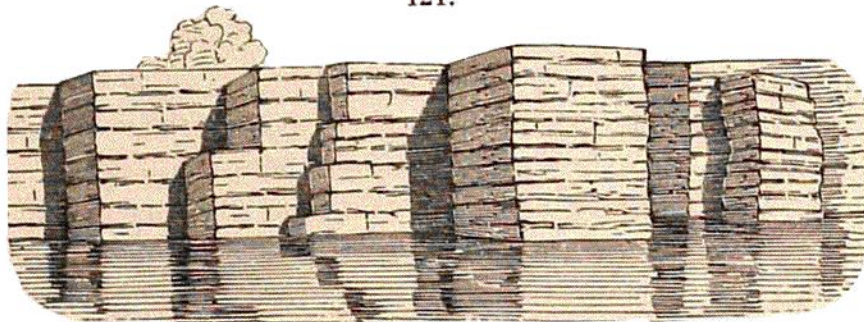


waters from time to time tumbles down an outer range, and exposes a new series of structures.

Traversing the surface of a region thus intersected, the joints appear as mere fractures, and are remarkable mainly for their great extent, number,

121.

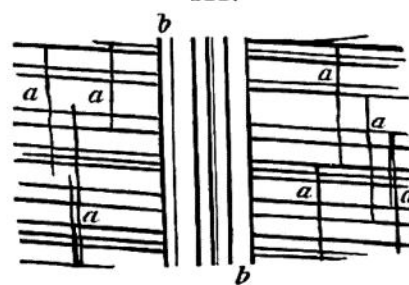


Jointed rocks, Cayuga Lake. Hall, '43.

and uniformity. In case of two systems of joints, — the case most common, — the rock breaks into blocks, which are rectangular or rhomboidal, according as the joints cross at right angles or not. The main system of joints is sometimes parallel to the strike of the uplifts, or else to the range of elevations or mountains in the vicinity, or to some general mountain range of the continent.

In many cases, a rock is so evenly and extensively jointed as to become thereby laminated, and in such a case the joints may be easily mistaken for planes of stratification, especially when the latter have been obliterated. Sometimes there are sudden transitions from the regular stratification to vertical joints, as in Fig. 122. This case occurs in a section of part of a quartzite bluff on the railroad near Poughquag, Dutchess County, N.Y. *a, a, a* are ordinary joints in the stratified rock; *b, b* is a portion of the rock, which has lost its stratification entirely, and has become jointed vertically; the transition from the stratified to the part *b, b* is so abrupt that the latter has the aspect of an intersecting dike, or of a portion of the laminated sandstone set erect. It occurs in sand-beds, whose grains adjust easily, like shot, to pressure.

122.



Jointed quartzite. D. '72.

Fig. 124 represents a rock with two cleavage-directions; and 125 a quartzose sandstone which has irregular cleavage-lines. These last two cases, together with that represented in Fig. 122, appear to show that the jointed structure and slaty cleavage may have a similar origin.

*Slaty and foliated structure.* — In the slaty structure, or slaty cleavage, the rock is divided into thin even sheets or laminæ, as in the case of roofing-slate or writing-slate. The laminated structure of shales is parallel to the bedding, and is due to the conditions of deposition and the pressure of super-