

preparation of sections of rocks for microscopical examination, the methods of procedure in the practice of this part of geological research, and some of the terms employed in the following pages.

1. *Microscopic Elements of Rocks*

Rocks when examined in thin sections with the microscope are found to be composed of or to contain various elements, of which the more important are, 1st, crystals, or crystalline substances; 2d, glass; 3d, crystallites; 4th, detritus.

A. CRYSTALS OR CRYSTALLINE SUBSTANCES.—Rock-forming minerals, when not amorphous, may be either crystallized in their proper crystallographic forms (idiomorphic), or while possessing a crystalline internal structure, may present no definite external geometrical form (allotriomorphic, p. 209). The latter condition is more prevalent, seeing that minerals have usually been developed round and against each other, thus mutually hindering the assumption of determinate crystallographic contours. Other causes of imperfection are fracture by movement in the original magma of the rock, and partial solution in that magma (Fig. 12), as in the corroded quartz of quartz-porphyrines and rhyolites, and the hornblende crystals of basalts. The ferro-magnesian minerals of earlier consolidation among basalts and andesites, are sometimes surrounded with a dark shell called the corrosion-zone. In some rocks, such as granite, the thoroughly crystalline character of the component ingredients is well marked, yet they less frequently present the definite isolated crystals so often to be observed in porphyries and in many old and modern volcanic rocks. Among thoroughly crystalline rocks, good crystals of the