

that it is sometimes a good deal easier to discover the fossiliferous zones in the Beekmantown than the glomerates subjacent to them. The study of intraformational glomerates includes a careful examination of the phenoclasts and cement as well as the structure and field relations of the strata above and below the zone in question. The examination of the texture, shape and composition of the phenoclasts and cement is mainly petrographic in its nature, and upon it will largely depend the plausibility of the students' views as to origin.

Certain liberties have been taken with Walcott's original definition of intraformational conglomerates. This was deemed necessary for two reasons: first, because some of the types discussed by Walcott are not typically conglomeratic (in the geological sense); second, because the term is such a useful and necessary one in stratigraphy that it should be applicable to an important group of clastics intimately associated with the history of the Paleozoic and Mesozoic seas. Whether or not it will ultimately be deemed advisable to group such rocks as tectibreccias, bioglomerates and edgewise conglomerates under the term intraformational is open for discussion. The attempt has been made to list and classify certain clearly, as well as obscurely, defined examples of limestones, with the hope that this systematic study may help in reaching the ultimate goal—the history and origin of the calcareous terrains of the world.

DESCRIPTION OF FIGURES.

FIGURE 1.—Diagrammatic sketch of a supposed bioglomerate from the lower Beekmantown limestone at Bellefonte, Penna. The large phenoclast on the right hand side of the figure shows structure which may be organic in origin. Most of the phenoclasts present peculiar outlines not at all similar to the outlines of the pebbles in an ordinary conglomerate. The small dots are supposed to represent agal-like organisms which have worked their way into the soft limy material and broken it up into the characteristic shapes shown in the diagram. The phenoclasts are fine grained, and sometimes contain fragments of small fossils. Most of the fossils, however, are found in the more granular ground mass.

FIGURE 2.—This figure is illustrative of an actual specimen of mud-cracked limestone found in one of the quarries at Bellefonte, and illustrates on a smaller scale the phenomena exhibited on the east wall along the strike of the quarries from Bellefonte to Tyrone, Pennsylvania. The shaded lines on the surface, traversed by the two parallel calcite veins, represent mud-cracks. Viewed in section the structure is that of a typical stratified glomerate. The figure is supposed to illustrate the