

force or push and drag of a glacier has been supposed to have produced folding and overthrusting in the partly consolidated Pleistocene clays which it overrode. A single case has been mentioned by Sardeson (15) in which the loosening of subjacent limestone strata consequential to glaciation, has produced a local brecciation. This case is not intraformational under Walcott's definition, as the beds in question are Paleozoic in age, but it is conceivable that the glaciation of certain surfaces might have produced true intraformational breccias. It has been supposed that the close and peculiar folding in certain Pleistocene clays and delta deposits is the result of "drag" by grounding icebergs. Whether or not these folds owe their origin to such a cause, it is probably doubtful if intraformational breccias could be formed in this way, owing to the peculiar consistency of the sediments. The argument here against brecciation as a result of intense folding and overthrusting is much the same as in the case of subaqueous-gliding-deformation in clay deposits.

#### CONCLUSIONS.

The attempt has been made in the foregoing pages to classify intraformational glomerates according to their possible as well as probable origin. It is fully realized that the classification is merely preliminary in its scope, and no attempt has been made to cover all the literature on the subject. The thesis has been to emphasize the importance of certain textures and structures, especially in limestones, and to suggest that their systematic study may lead to a more comprehensive view of the history of the seas from and under which they were deposited. Walcott was the first to define the difference between intraformational and interformational conglomerates. His paper is important as it deals with the origin and deposition of limestones, and points the way to a more careful consideration of unconformity and disconformity in the field. Wherever the stratigrapher finds a change in the structure of the zones, no matter how superficial such change may at first appear, he should be on his guard for a probable change in the conditions of deposition and all the attendant geological phenomena, which may hypothetically be the *cause* of such a change. It has been pointed out that the usual rock section, as exposed by streams and roads, is apt to give little or no evidence of important structural phenomena, such as ripple-marks, mud cracks, etc. Under certain conditions intraformational limestone glomerates are very difficult to detect in the field, owing to the more or less homogenous composition of the phenoclasts and cement. The relation of intraformational zones to fossiliferous zones is of great significance in the study of limestones, and it has been found