DESCRIPTION, CLASSIFICATION, AND NOMENCLATURE OF SEDIMENTARY ROCKS

Part V: Secondary Sedimentary Structures

Soft Sediment Deformation

Physical compaction of sediment during progressively deeper burial produces a sequence of secondary sedimentary structures. In muds, which compact to 1/8th their original volume, sedimentary layers thin through loss of porewater during compaction. Clays and other foliate and linear sedimentary particles are realigned into horizontal orientation, permitting the development of fissility. Burrow structures are deformed from circular into ellipsoidal shapes in cross-section, and can be used in fact to estimate percent compaction (Figure 1). During compaction, muds are deformed ("flow") around bodies of less compactible sediments such as sands and gravels. Figure 2 illustrates a boudinage (literally sausage) deformation of a sand layer by downward flowage of interbedded muds. Sandstone dikes, produced by the upward escape of water-laden sands through less permeable muds, also arise during early compaction.

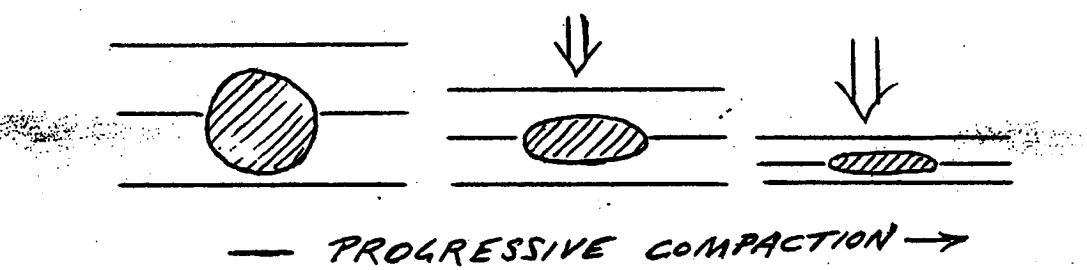

Figure 1. Compaction deformation of cross-sectional shape of burrow structures. Such burrows can be used like ooids and fossils in compaction and deformation analysis of rocks.