(including, for convenience in discussion, the coarser varieties, breccias and conglomerates), at or near the shore line. As distance from the shore line increases (temporarily assuming a gradually deepening of the water seaward) these arenaceous materials will grade gradually through arено-argillaceous to argillaceous, and thence through argillo-calcareous to calcareous, as the distance from the shoreline increases. In Figures 1, 2, and 3 (omitting zones of transition) A represents the sinking oldland upon which the sediments are being laid down and from which the detritus is derived, B represents the arenaceous zone, C the argillaceous, and D the calcareous, the relatively narrower transition zones between B and C, and between C and D, being conveniently represented by lines. During the course of time these deposits become more or less coherent, according to the conditions to which they may be subjected. In the subsequent discussion these separate zones of deposition may be referred to as the sandstone, the shale or the limestone zone, it being, however, recognised that there are also zones of transition between adjacent pairs.

It would seem that any given stratum must have three synchronous members, each merging gradually into the adjacent member or members. The beds composed of strata, which have been deposited successively must also each consist of these three members. The fact that the thickness of the stratum must, in each of the zones, be dependent upon the amount of material present must necessarily lead to the recognition of the other fact that under certain conditions of supply a stratum of considerable thickness might be laid down in one zone, while the strictly synchronous equivalent in either of the other zones might be represented by a very small amount of deposit, or by *none at all*. Through the operation of certain imperfectly understood causes, probably climatic, directly or indirectly, strata are found grouped together into beds, and it is conceivable, though *not always prob-*