orite facies (Buckner), a mid-ramp quiet-water facies, a ramp crest grainstone oolitic-facies and a ramp slope facies. Small patches of biohermal or reefal facies are depicted by dark grey shading and these biohermal entities are located at the seaward margin of the ramp crest or slightly down the ramp slope. Biohermal masses within cycles 1-3 are spatially restricted and inhibited from becoming pinnacle buildups due to two factors: (1) the declining accommodation within 2nd-order HST, each biohermal entity is smothered in carbonate sand from above as the next cycle progrades out and over the bioherm; (2) related to the same accommodation problem, "nasty" bank water of elevated salinities from the Buckner facies washes seaward over the bioherms adversely affecting their growth.

The 2nd-order HST passes into the 2nd-order LST between eustatic beats 4 and 5 where the rate of 2nd-order fall is at a maximum (the inflection point on the 2nd-order eustatic curve). This point marks the 2nd-order super-sequence boundary and equates hypothetically to the 144 m.y. supersequence boundary in the Lou-Ark framework presented previously. In this position of stratigraphic reversal, the system turns around from progradation related to progressive accommodation loss, to retrogradation caused by progressive accommodation gain.

From here on, each high-frequency beat becomes progressively submergence prone and the ramp cycles display a retrogradational stacking architecture with increasing topographic relief as they march updip. Pinnacle buildup development is now promoted as problems (1) and (2) outlined previously are alleviated. For example, between ramp cycles 4 and 5, biohermal growth which initiated during cycle 4 can continue because the ramp crest of cycle 5 (or rollover point) is now located slightly updip, or landward, of the ramp crest of cycle 4. Because of this relationship, it is hypothesized that the biohermal contribution from cycle 5 will stack vertically on the ready-made foundation of the healthy bioherm from cycle 4.

The 2nd-order TST occurs between eustatic beats 6-12 as the rate of 2nd-order fall declines, and passes through its trough and back into a 2nd-order rise. The composite eustatic effect each of high-frequency beat becomes progressively submergence- prone and overall accommodation increases, promoting pinnacle development. In detail, above cycle 5, each reef cycle is broken into its high-frequency transgressive and regressive phases. The net result is that each pinnacle buildup is cyclic with contributions from 2 to 4 eustatic beats. The furthest downdip pinnacle reef consists of contributions from cycle 4 through the transgressive part of cycle 7. By contrast, the most updip pinnacle only contains contributions from cycle 8 and the transgressive phase of cycle 9. The most downdip pinnacles are therefore the oldest and were drowned during the overall regional 2nd-order transgression prior to the inception of the most updip pinnacle. A lack of appreciation of the true chronostratigraphic and dynamic relations summarized here has lead to the misperception by some workers that the downdip pinnacles are deep water and the updip pinnacles shallow water. With respect to internal facies composition and petrophysical parameters, each pinnacle is vertically heterogeneous.