

Lower Carboniferous (Late Viséan) platform development and cyclicity in southern Ireland: foraminiferal biofacies and lithofacies evidence

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Abstract.

The stratigraphy of several well exposed late Viséan carbonate successions in southern Ireland have been correlated using high resolution foraminiferal/algal biostratigraphy and detailed biofacies analysis. This study has revealed that during the lower late Viséan (early Asbian) time platform mudbank and intrabank facies were deposited on a rimmed ramp that dipped southward. By upper late Viséan (late Asbian to Brigantian) time, well bedded carbonates were deposited on a shallow, unrimmed platform expanse that prograded southward through a series of shallowing-upward minor cycles. Within the late Asbian successions numerous minor cycles (2-15 m thick) occur that contain distinctive lithofacies and three distinct foraminiferal biofacies. The top of these cycles can usually be identified by palaeokarst surfaces with relief of to 0.5 m associated with pedogenic features and fissures indicating initial palaeocave-forming processes. Deposits on these emergent boundary surfaces include thick palaeosols (up to 1 m thick) and eroded boulders of the underlying karst surfaces. The lower transgressive facies of each minor cycle often began with the deposition of shallow-water, subtidal, algal-rich limestone containing diverse foraminiferal biofacies (Biofacies type 2). New foraminiferal taxa may appear in this part of the cycle. Towards the middle part of each cycle deeper water, subtidal, foraminiferal biofacies occur, but with no significant first appearance data. The biofacies at this level in the cycle are often algal-poor limestone rich in bryozoans or crinoids (Biofacies type 1). Biostratigraphically important foraminiferal taxa often first appear or reappear in low diversity assemblages toward the top of most cycles in shallower water grainstone microfacies (Biofacies type 3) rich in dasycladacean algae.