

FACIES STUDY OF “THE COVER” LAYERS IN THE UPPER CAMBRIAN MICROBIAL REEF COMPLEX - MASON COUNTY – TEXAS – US.

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SUMMARY: In the past years, research on carbonates of microbial origin has gained interest in industry as well as in academia due to important discoveries of hydrocarbons in pre-salt microbial reservoirs in Campos, Santos and Espírito Santo basins (offshore Brazil) and NASA focus on finding potential evidence of life outside the Earth, especially on Mars. During the Upper Cambrian period, the world was composed of four main landmasses: Laurentia, Baltica, Siberia, and Gondwana. Central Texas was located on the southwestern margin of Laurentia and this particular area, like most of the North American craton, was composed of a monotonous, relatively featureless, shallow marine shelf (the Great American Carbonate Bank) dominated by carbonate sedimentation. In this context, the Point Peak and San Saba Members of Wilberns Formation comprise spectacular carbonate successions among which microbial reef complexes and its cover layers crop out on perfect 3D exposures along James and Llano Rivers on recently accessible private ranches (Zesch and Eagle Ridge Ranches of Mason County). “The Cover” layers, referred as those which overlying the carbonate buildups (bioherms and biostroms) and also those materializing the base of San Saba Member, represent the end of microbial growth characterized by a set of predominantly skeletal packstones, which holds fundamental clues for the entire reef-biota demise through the Cambro-Ordovician limit. Thus, the main goal of this research is to understand why the reef complexes of the Upper Point Peak Member stop growing and under which environmental conditions. To achieve this, we performed a detailed faciological description of “The Cover” based on eight oriented cores with about 15 centimeters in diameter and up to 40 centimeters long, 12 thin sections, field descriptions regarding the layers’ architecture, and laboratory analysis in order to produce a paleoenvironmental model based on lithofacies and fossil assemblage. From this, we observe a series of finning upwards facies as well as intraclasts whose the fossil assemblage is completely different from that on the packstone’s matrix. The combination of these evidences were interpreted as a series of energetic events such as storms, which were capable of reworking the high-energy shoal where the environment would be somewhat deeper than the previous conditions in which the microbial buildups could growth vigorously.

KEY WORDS: PACKSTONES, MICROBIAL REEF, UPPER CAMBRIAN