

Sedimentology and Petrology of Lower Mississippian Carbonate Mounds in the Ozark Region, North America

M. A. Unrast¹, J. M. Gregg¹, J. O. Puckette¹, and I. D. Somerville²

¹*Oklahoma State University, Stillwater, OK*

²*University College, Dublin, Ireland*

Mississippian crinoidal-bryozoan carbonate mounds in the Ozark region formed on the southern edge of the Burlington Shelf. The Ozark mounds are contained within the St. Joe Group, which includes the Compton and Pierson Limestones. The Ozark mounds, which have been called Waulsortian or Waulsortian-type, are composed of wackestone-packstone core facies with crinoidal packstone flanking beds. The mounds have asymmetrical knoll-form geometry with dimensions of approximately 7m to 97m wide and 1m to 11m high.

The carbonate mounds in the Compton Limestone have micrite rich cores (61% micrite, 39% bioclasts). In contrast, mound cores in the Pierson Limestone are richer in bioclastic grains (26% micrite, 74% bioclasts). The mounds in the Compton Limestone are interpreted to have formed in deeper and calmer water, whereas the mounds in the Pierson Limestone may have formed at shallower depths as evidenced by more abraded skeletal fragments and a lower percentage of mud. Field observations and petrography indicate that carbonate mounds in the Ozark region are distinct from Waulsortian mounds in northern Europe and likely were deposited under shallower-water shelf conditions as opposed to deeper-water ramp settings as has been postulated for Waulsortian mounds in Europe. The results of this study may allow a classification system of crinoidal-bryozoan carbonate mounds to be developed based on statistical analysis of petrographic data.