
Petrographic and Faunal Characterization of Monteagle and Hartselle-Equivalent Strata in Northeastern Alabama

Douglas W. Haywick¹, David C. Kopaska-Merkel², and Richard Keyes³

¹Department of Earth Sciences, University of South Alabama, LSCB 136, Mobile, Alabama 36688

²Geological Survey of Alabama, P.O. Box 869999, Tuscaloosa, Alabama 35486

³P.O. Box 21061, Huntsville, Alabama 35813

GCAGS Explore & Discover Article #00016*

http://www.gcags.org/exploreanddiscover/2016/00016_haywick_et_al.pdf

Posted September 13, 2016.

*Abstract extracted from a full paper published in the *GCAGS Transactions* (see footnote reference below), which is available as part of the entire 2016 *GCAGS Transactions* volume via the GCAGS Bookstore at the Bureau of Economic Geology (www.beg.utexas.edu) or as an individual document via AAPG Datapages, Inc. (www.datapages.com), and delivered as an oral presentation at the 66th Annual GCAGS Convention and 63rd Annual GCSSEPM Meeting in Corpus Christi, Texas, September 18–20, 2016.

ABSTRACT

Chesterian (Mississippian) strata in northern Alabama comprise a mixture of shallow marine carbonate and siliciclastic units. Monteagle Limestone consists primarily of medium- to thick-bedded skeletal grainstone consisting of oolitic intervals and thin lenticular layers of green-gray calcareous shale. The Hartselle Sandstone is mostly quartzarenite in north-central Alabama, but toward the northeast, near its stratigraphic terminus 30 km east of Huntsville, Alabama, Hartselle-equivalent strata consist primarily of shale with thin skeletal limestone and calcareous sandstone interbeds. We studied four sections along U.S. Highway 72 that cut through the Monteagle-Hartselle interval in this region in order to resolve the petrography and faunal characteristics of these strata. Monteagle Limestone is dominated by skeletal grainstone enriched in echinoderm and bryozoan debris. Some allochems are ooliticly coated. Parallel-laminated to low-angle cross-laminated oolites occur locally. Two intervals are marked by prominent color variation and lenses of green-gray calcareous shale. Dolomitized intervals, some pervasive, are found in all of the outcrops. Portions of the Monteagle contain well-sorted sub-rounded dolomite clasts, which likely originated from erosion of dolostone during syndimentary subaerial exposure. The Hartselle-equivalent interval consists of tan/brown to gray-black bituminous and fossiliferous silty shale with interbedded lenticular to channelized skeletal grainstone beds. Brachiopods and crinoids are common in both rock types, but limestone strata also contain bryozoans (including *Archimedes* and rare rugose corals. Microbial colonies coat many of the skeletal allochems and form one small buildup atop limestone at the base of the Hartselle-equivalent interval. Two smaller mounds were found within dolostone intervals in the Monteagle. Lithofacies relationships between the four sections suggest that the Monteagle Limestone was deposited as a series of carbonate shoals and that calcareous shale might have formed in slightly deeper water intershoal areas. Hartselle-equivalent shale was deposited in shallow water in advance of a prograding siliciclastic wedge derived from the southwest, but interdigita-

Originally published as: Haywick, D. W., D. C. Kopaska-Merkel, and R. Keyes, 2016, Petrographic and faunal characterization of Monteagle and Hartselle-equivalent strata in northeastern Alabama: *Gulf Coast Association of Geological Societies Transactions*, v. 66, p. 211–229.

tion with carbonate lithofacies was common. Shallow marine carbonate sedimentation (Bangor Limestone) resumed domination on the platform soon after deposition of the Hartselle.