

## **Stromatoporoids around the Georgetown, Kentucky area**

If you have ever visited and / or travelled around the area of Georgetown, Scott County, Kentucky you might have noted white watermelon shaped rocks exposed in road cuts, that seem to be out of place with the thinly bedded limestone that predominates the Central Kentucky Bluegrass area. You may even possibly travel the same route going to work every day and not pay any attention to the rocks exposed in road cuts along your route. There are many geological features exposed in the road cuts along Kentucky's roads that have stories to tell to the trained observer. The large white rocks of the Georgetown area are called "stromatoporoids". The stromatoporoids are presumed to be the fossils of a sponge-like animal.

The fossilized stromatoporoids in the Georgetown area are found associated with Ordovician age (500–440 million years before present time) thinly bedded limestone of the Tanglewood Limestone Member of the Lexington Limestone. According to the U.S. Geological Survey Geologic Map of the Georgetown Quadrangle, Scott and Fayette Counties, Kentucky (Cressman, 1967) the Tanglewood Limestone Member is described as slightly phosphatic, light- to medium-gray to medium-brownish-gray, fine- to coarse-grained, biodastic, generally well-sorted; in even beds and crossbedded sets mostly 0.5 to 1 foot thick. Two zones of stromatoporoids are identified as being present in the Tanglewood Limestone Member. The upper stromatoporoid zone occurs about 35 feet below the base of the overlying Millersburg Member of the Lexington Limestone and the lower zone occurs about 10 feet below the upper stromatoporoid zone.

Taha and others (2001) have identified the stromatoporoid zone as being part of the Stamping Ground Member of the Middle Ordovician upper Lexington Limestone. The Stamping Ground Member is described by Taha and others (2001) as a 3-4 meter thick package of interbedded shale and limestone locally containing abundant stromatoporoids of the species *Labechia huronensis*. The Stamping Ground commences with shaly, nodular wackstones and coarsens upward to a thick grainstone. The Stamping Ground Member has been identified by geological mapping in parts of the Midway (Pomeroy, 1970), Georgetown (Cressman, 1967) and Centerville (Kanizay and Cressman, 1967) 7.5-minute quadrangles. The stratigraphy of the Stamping Ground Member has been described by Cressman in the Lithostratigraphy and Depositional Environments of the Lexington Limestone (Ordovician) of Central Kentucky (U.S.G.S. Professional Paper 768, 1973). Cressman identifies the Stamping Ground Member as a localized unit of the Lexington Limestone within the Tanglewood Limestone Member, with the type section identified in a rock quarry located on the north side of the Switzer-Stamping Ground Road, 2,700 feet west of its intersection with U.S. Highway 227, Scott County, Kentucky.

There are a series of road cuts along McClelland Circle (U.S. Highway 62 / 460) near the intersection with Lexington Road (U.S. Highway 25) in Georgetown that have good exposures of stromatoporoid fossils. McClelland Circle is a by-pass around the southern side of the City of Georgetown that connects at Cherry Blossom Way to the east and ends at Frankfort Road (U.S. Highway 460) to the west. The series of road cuts is approximately one-half mile in overall length with the eastern end of the exposure at Latitude 38 degrees 11 minutes and 05.6 seconds / Longitude 84 degrees 33 minutes and 15.9 seconds (near the former Wal-Mart shopping Center) and western end of the exposure at Latitude 38 degrees 10

minutes and 58.0 seconds / Longitude 84 degrees 33 minutes and 56.2 seconds. The highest of the road cuts is approximately 20 feet with the stromatoporoid zone easily visible at about 5-10 feet above road level.

Stromatoporoid fossils have been identified in carbonate sedimentary deposits from the Cambrian to the Oligocene and were until recently believed to be extinct. Stromatoporoids were reef forming organisms. It can therefore be concluded that water levels during deposition of Tanglewood Limestone Member were relatively shallow. Upon close inspection of a stromatoporoid one can see numerous thin stacked parallel layers. The layers formed by the secretion of a calcareous skeleton as the sponge-like animal grew and can be looked at as similar to annual growth rings found in tree trunks. According to the Glossary of Geology (Bates and Jackson, 1980) the internal structural elements are normally arranged sub-horizontally or as concentric laminae or lines separated by small radial pillars.

The McClelland Circle road cuts are located within the Royal Springs ground water recharge area. Royal Springs is the source of drinking water for a large part of the Georgetown area. Surface water resulting from rain and snow infiltrates through fractures in the predominantly limestone bedrock and flows to Royal Springs, where it again becomes surface water.

The McClelland Circle road cuts are not the only location where stromatoporoid fossils can be found in the Central Kentucky area. See if you can identify other exposures of the Stamping Ground Member of the Ordovician age Lexington Limestone.

### References

Cressman, E.R., 1967, Geologic Map of the Georgetown Quadrangle, Scott and Fayette Counties, Kentucky. U.S. Geological Survey, Map GQ-605.

Cressman, E.R., 1973, Lithostatigraphy and Depositional Environments of the Lexington Limestone (Ordovician) of Central Kentucky. U.S. Geological Survey, Professional Paper 768.

Kanizay, S.P., and Cressman, E.R., 1967, Geologic Map of the Centerville Quadrangle, Central Kentucky. U.S. Geological Survey, Map GQ-653.

Pomeroy, J.S., 1970, Geologic Map of the Midway Quadrangle, Central Kentucky. U.S. Geological Survey, Map GQ-856.

Sparks, T.N., Dever, G.R., Jr., and Anderson, W.H., 2002, Geologic Map of the Lexington 30 x 60 minute Quadrangle, Central Kentucky (scale 1: 100,000), Kentucky Geological Survey Geologic Map Series 002-12, Lexington, Ky., 1 page.

Georgetown Quadrangle, Kentucky, 7.5 Minute Series (Topographic), U.S. Geological Survey, 1965, revised 1993.

Bates, R.L and Jackson, J.A., editors, 1980, Glossary of Geology, second edition, American Geological Institute, Falls Church, Va.

Taha, S.L., Brett, C.E., McLaughlin, P.I., Krause, R.A. and Hudson, T.W., 2001, North-Central Section Geological Society of America, 35<sup>th</sup> Annual Meeting, Illinois State University.

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Aerial photographic imagery of Georgetown road cuts obtained from <http://www.terraserver.com>

Ground level photographs of road cut and stromatoporoids by Gil W. Cumbee, CPG, PG, 2010.

Polished slabs of stromatoporoid courtesy of Patrick Gooding, Kentucky Geological Survey.









