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Schoenophyllum aggregatum Zone: Stratigraphic Marker for Investigations of Mississippian Limestones in Western Kentucky

Garland R. Dever Jr.
University of Kentucky

Preston McGrain
University of Kentucky

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Kentucky Geological Survey
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***Schoenophyllum aggregatum* Zone: Stratigraphic
Marker for Investigations of Mississippian
Limestones in Western Kentucky**

Garland R. Dever Jr. and Preston McGrain

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Contents

Abstract.....	1
Introduction	1
<i>Schoenophyllum aggregatum</i>	1
Western Kentucky Occurrence.....	2
Eastern Kentucky Occurrence	4
Additional Occurrences	8
Summary	8
Acknowledgments.....	8
References Cited.....	9
Appendix 1: Measured Section at Yager Materials Riverside Mine.....	11
Appendix 2: Measured Section at Liter's Irvington Quarry	12
Appendix 3: Measured Section at Hanson Aggregates Upton Quarry.....	14
Appendix 4: Measured Section at Hart County Stone Horse Cave Quarry	18
Appendix 5: Measured Section at Abandoned Huckleberry Knob Quarry	23
Appendix 6: Measured Section at Bluegrass Materials Barren River Quarry.....	23
Appendix 7: Measured Section at Rogers Group Princeton Quarry	25
Appendix 8: Measured Section at Bluegrass Materials Hartford Quarry	26
Appendix 9: Measured Section of Stab Roadcuts and Outcrops	28

Figures

1. Photo showing <i>Schoenophyllum aggregatum</i> colonies (in part silicified), abandoned Smiths Grove Quarry, Warren County.....	2
2. Map showing location of selected <i>Schoenophyllum aggregatum</i> occurrences in Ste. Genevieve Limestone of western Kentucky and correlative rocks of the Monteagle Limestone, Slade Formation, and Newman Limestone of eastern Kentucky.....	2
3. Cross section showing stratigraphic position of the <i>Schoenophyllum aggregatum</i> Zone in the Ste. Genevieve Limestone of western Kentucky	4
4. Photo showing <i>Schoenophyllum aggregatum</i> colonies (in part silicified), abandoned Smiths Grove Quarry, Warren County.....	5
5. Photo showing <i>Schoenophyllum aggregatum</i> colony, Liter's Irvington Quarry, Breckinridge County	5
6. Photo showing <i>Schoenophyllum aggregatum</i> colonies and fragments (in part silicified), outcrop on Loves Knob, Barren County.....	6
7. Photo showing silicified fragments of <i>Schoenophyllum aggregatum</i> corallites, abandoned Park City Quarry, Edmonson County	6
8. Cross section showing stratigraphic position of the <i>Schoenophyllum aggregatum</i> Zone east of the Cincinnati Arch in the Monteagle Limestone and Slade Formation of south-central Kentucky	7

Table

1. Selected <i>Schoenophyllum aggregatum</i> occurrences in Kentucky	3
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***Schoenophyllum aggregatum* Zone: Stratigraphic Marker for Investigations of Mississippian Limestones in Western Kentucky**

Garland R. Dever Jr. and Preston McGrain¹

Abstract

Schoenophyllum aggregatum, a Mississippian colonial rugose coral, has a widespread geographic distribution and narrow stratigraphic range in the upper Ste. Genevieve Limestone of western Kentucky. This coral zone serves as a useful stratigraphic marker for commercial and geologic investigations of the extensive limestone deposits formed by the Ste. Genevieve and enclosing limestone units in the region. *S. aggregatum* is also present in rocks correlative with the Ste. Genevieve that occur in the Monteagle Limestone and Slade Formation of south-central Kentucky and the Newman Limestone of southeastern Kentucky.

Introduction

Formations of Mississippian age in western Kentucky provide large quantities of limestone for construction, agriculture, and industrial uses. A major source of stone throughout the region is the Ste. Genevieve Limestone, 140 to 300 ft thick, which consists of limestone (micrograined to coarse-grained, bioclastic, oolitic, fossiliferous, cherty, and argillaceous), lesser amounts of dolomite (microcrystalline to very finely crystalline), and minor sandstone (very fine-grained). Across western Kentucky, the Ste. Genevieve is directly overlain by formations composed of similar lithologies: Paoli Limestone (east), Girkin Formation (south), and Renault Limestone (west). Together with the Ste. Genevieve, these units form extensive intervals of commercial-grade stone. The St. Louis Limestone, which generally does not contain stone suitable for commercial exploitation, underlies the Ste. Genevieve throughout the region.

Schoenophyllum aggregatum

The colonial rugose coral *Schoenophyllum aggregatum* Simpson (Sando and Bamber, 1985) serves as a practical stratigraphic marker within this thick sequence of Mississippian carbonates in western Kentucky (Fig. 1). It has a widespread distribution across the region in the upper Ste. Genevieve where it is restricted to a thin zone, commonly 1 to 2 ft in thickness, but locally as much as 10 ft thick. The position of the zone ranges from about 20 to 60 ft below the top of the formation (Table 1, Figs. 2-3). In earlier reports, *S. aggregatum* was identified as *Lithostrotion harmodites* Milne-Edwards and Haime, *Lithostrotion (Siphonodendron) genevievensis* Easton, or *Siphonodendron(?)* aff. *S. genevievensis* Easton.

S. aggregatum occurrences in quarries and outcrops range from well-preserved, in-place colonies (Figs. 4-6) to only a few scattered fragments (Fig. 7). The colonies are composed of slender sub-parallel corallites (average diameter 4 mm; range 3-5 mm). Interior and exterior morphology was described by Easton (1957) and Sando and Bamber (1985). Silicification of the fossils is common.

¹Late assistant state geologist, Kentucky Geological Survey



Figure 1. *Schoenophyllum aggregatum* colonies (in part silicified), abandoned Smiths Grove Quarry, Warren County.

Abundant colonial rugose corals of the genus *Acrocyathus* d’Orbigny occur immediately below the Ste. Genevieve in the underlying St. Louis Limestone, but with their distinctive robust corallites, the acrocyathid colonies are readily distinguished from the slender straw-like corallites of *S. aggregatum*. *Acrocyathus floriformis* d’Orbigny consists of

massive colonies of prismatic corallites ranging from 10 to 30 mm in diameter (Sando, 1983). Corallites of *A. proliferus* (Hall) are cylindrical and range from 12 to 15 mm in diameter. In earlier reports the acrocyathid corals commonly were identified as *Lithostrotionella castelnaui* Hayasaka and *Lithostrotion proliferum* Hall.

Western Kentucky Occurrence

In this report, the stratigraphic position of *S. aggregatum* is referred to the top of the Ste. Genevieve (Fig. 3). That top generally is marked by a zone of brecciated limestone, commonly identified as the Bryantsville Breccia Bed, and by a change in crinoid fauna, from *Platycrinites penicillus* Meek and Worthen in the Ste. Genevieve to *Talarocrinus* Wachsmuth and Springer in the overlying Paoli, Girkin, or Renault. The Bryantsville is the remnant of a caliche paleosol with pedogenic features such as brecciated and melanized limestone

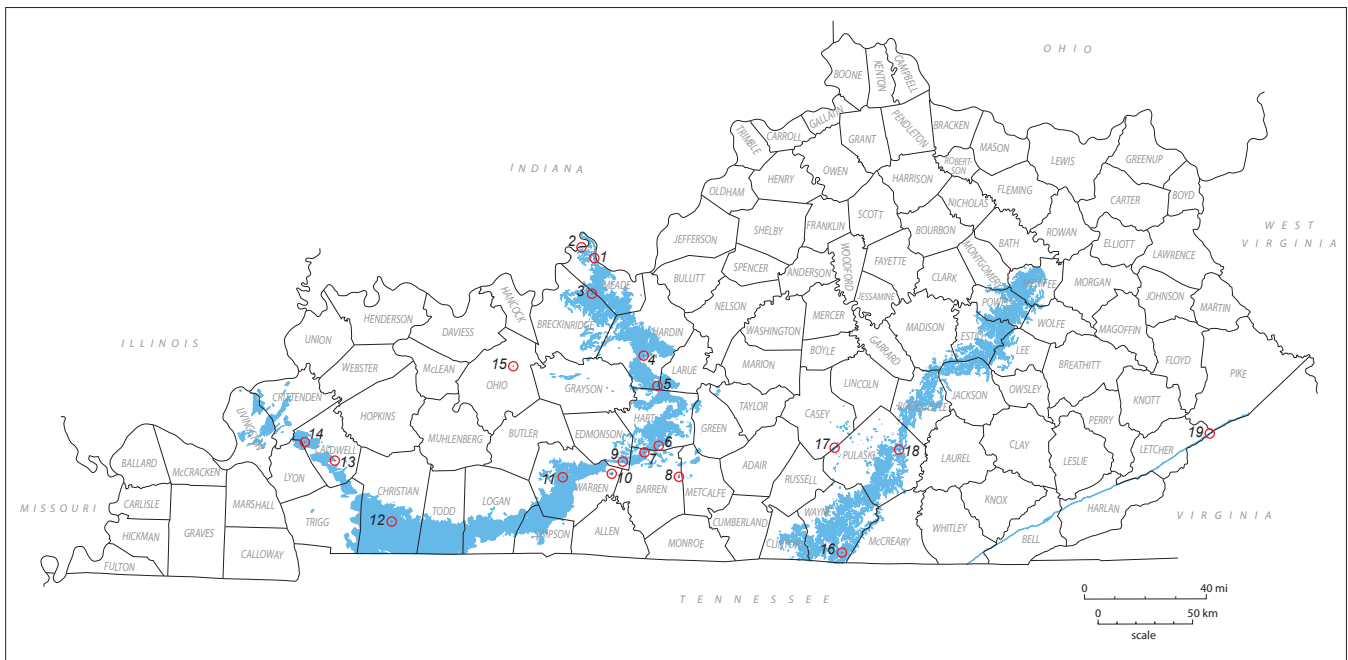


Figure 2. Location of selected *Schoenophyllum aggregatum* occurrences in Ste. Genevieve Limestone of western Kentucky and correlative rocks of the Monteagle Limestone, Slade Formation, and Newman Limestone of eastern Kentucky (see Table 1).

Table 1. Selected *Schoenophyllum aggregatum* occurrences in Kentucky (see Figure 2).

Number	County	Locality	Quadrangle	Annotation
1	Meade	Cemex Kosmos Cement Co. Battletown Quarry	New Amsterdam	
2	Meade	Yager Materials Riverside Mine	Leavenworth	Appendix 1 (measured section)
3	Breckinridge	Liter's Irvington Quarry	Irvington	Figure 5; Appendix 2 (measured section); Dever and others (1979)
4	Hardin	Abandoned Stephensburg Quarry	Summit	
5	Hardin	Hanson Aggregates Upton Quarry	Upton	Appendix 3 (measured section)
6	Hart	Hart County Stone Horse Cave Quarry	Horse Cave	Appendix 4 (measured section)
7	Barren	Abandoned Huckleberry Knob Quarry	Horse Cave	Appendix 5 (measured section)
8	Barren	Outcrops on Loves Knob	Hiseville	Figure 6
9	Edmonson	Abandoned Park City Quarry	Park City	Figure 7
10	Warren	Abandoned Smiths Grove Quarry	Smiths Grove	Figures 1 and 4; McGrain and Sutton (1973)
11	Warren	Bluegrass Materials Barren River Quarry	Bowling Green North	Appendix 6 (measured section)
12	Christian	Rogers Group Hopkinsville Quarry	Hopkinsville	
13	Caldwell	Rogers Group Princeton Quarry	Princeton East	Appendix 7 (measured section)
14	Caldwell	Lafarge Fredonia Quarry	Fredonia	R.D. Trace, U.S. Geological Survey, oral communication (1976)
15	Ohio	Bluegrass Materials Hartford Quarry	Dundee	Appendix 8 (measured section)
16	Wayne	Outcrops along Little South Fork near Mount Pisgah	Parmleysville	Taylor (1977)
17	Pulaski	Abandoned Green River Knob Quarry	Mintonville	Dever (1999)
18	Pulaski	Stab roadcuts and outcrops	Shopville	Appendix 9 (measured section); Dever (1999)
19	Letcher	Mountain Aggregates Jenkins Quarry	Jenkins East	Dever and others (1992)

and laminar micrograined calcrete (see Ettensohn and others, 1988). Similar paleosol remnants occur at multiple positions in the Ste. Genevieve (Fig. 3) and the overlying Beaver Bend and Paoli Limestones and Girkin Formation (Appendices 3, 4, and 6), which gives added value to the *S. aggregatum* Zone as a practical marker within this thick group of limestones.

Numerous workers have reported the presence of *S. aggregatum* in the Ste. Genevieve of western Kentucky: Ulrich and Smith (1905; Caldwell County), Butts (1917; Breckinridge County), Ulrich (1917; Caldwell County), Butts (1922; Breckinridge and Meade Counties), Weller (1923; Caldwell

County), Weller (1927; Edmonson County), Butts (1929; Breckinridge County), Mayfield (1934; Grayson County), Hose and others (1963; Breckinridge County), Kepferle (1963; Hardin County), Richards (1964; Warren County), Sable (1964; Breckinridge and Hardin Counties), Moore (1965; Hardin County), Haynes (1966; Barren and Hart Counties), Nelson and Seeland (1968; Christian and Trigg Counties), Seeland (1968; Caldwell and Trigg Counties), Pohl (1970; south-central Kentucky), McGrain and Sutton (1973; Warren County), and Dever and others (1979; Breckinridge County).

The stratigraphic position of the *S. aggregatum* Zone described in this report is in accord with Pohl

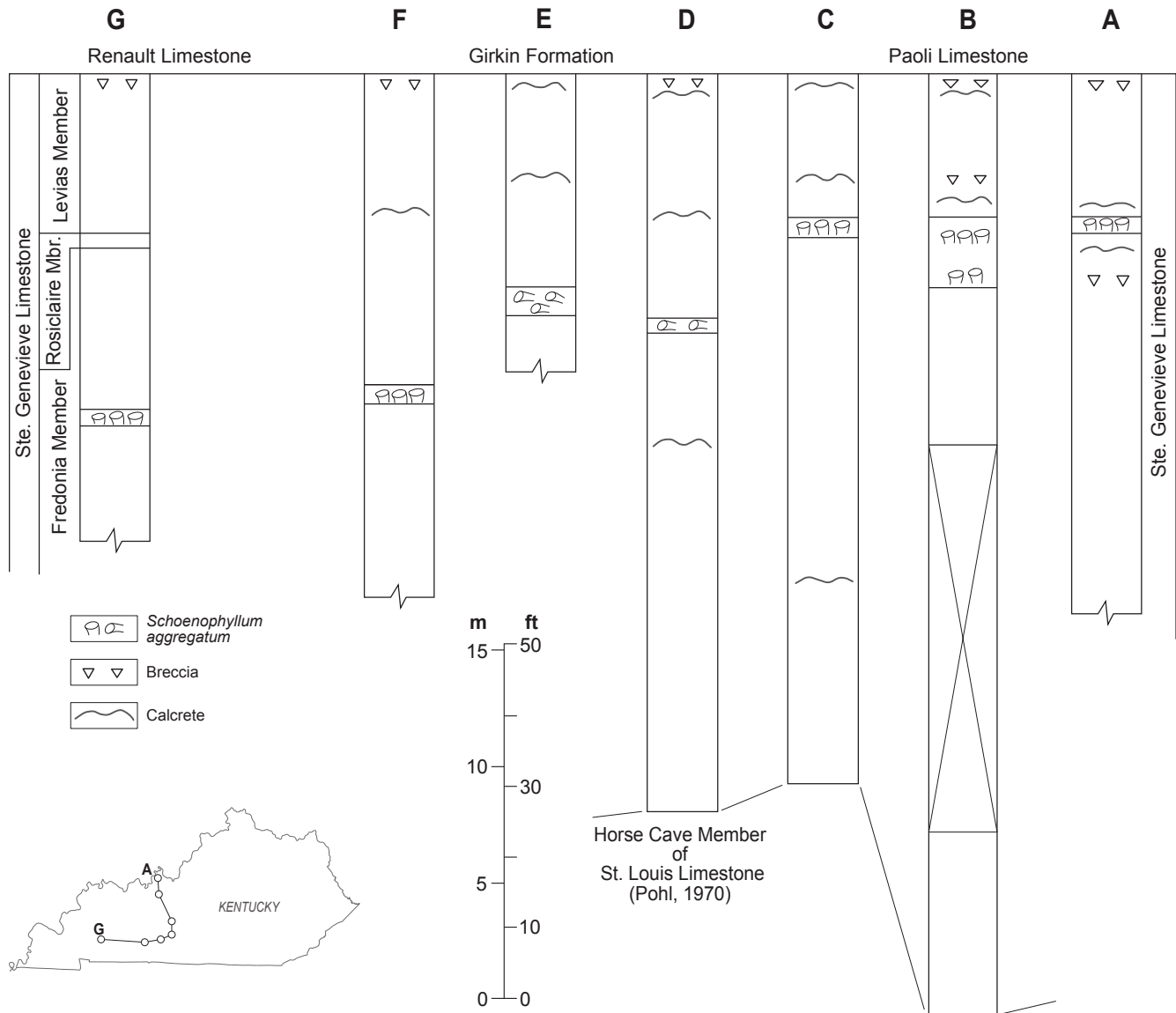


Figure 3. Cross section showing stratigraphic position of the *Schoenophyllum aggregatum* Zone in the Ste. Genevieve Limestone of western Kentucky. Pedogenic breccia and calcrete indicate the position of paleosols.

(1970), who noted that in south-central Kentucky, the coral occurs only in the upper Ste. Genevieve. A.N. Palmer (State University College, Oneonta, N.Y., written communication, 1987), however, reported that during his studies in Mammoth Cave, which is located in south-central Kentucky, the coral was found at two positions within the Ste. Genevieve, as that formation was identified by him in the cave system: (1) about 25 ft below the top of the unit and (2) about 90 ft below the top. The upper occurrence corresponds with the coral zone noted by Pohl (1970) and by this report. We have

seen an *S. aggregatum* colony in Mammoth Cave in limestone at the base of the metal tower in Mammoth Dome. Palmer considered that colony to be at the lower of the two positions in the formation. The possible presence of two coral zones in the Mammoth Cave area of south-central Kentucky warrants further investigation.

Eastern Kentucky Occurrence

S. aggregatum is also present in correlative rocks of the Monteagle Limestone and Slade Formation on the east side of the Cincinnati Arch in



Figure 4. *Schoenophyllum aggregatum* colonies (in part silicified), abandoned Smiths Grove Quarry, Warren County. Penny for scale.



Figure 5. *Schoenophyllum aggregatum* colony, Liter's Irvington Quarry, Breckinridge County.



Figure 6. *Schoenophyllum aggregatum* colonies and fragments (in part silicified), outcrop on Loves Knob, Barren County.



Figure 7. Silicified fragments of *Schoenophyllum aggregatum* corallites, abandoned Park City Quarry, Edmonson County. Penny for scale.

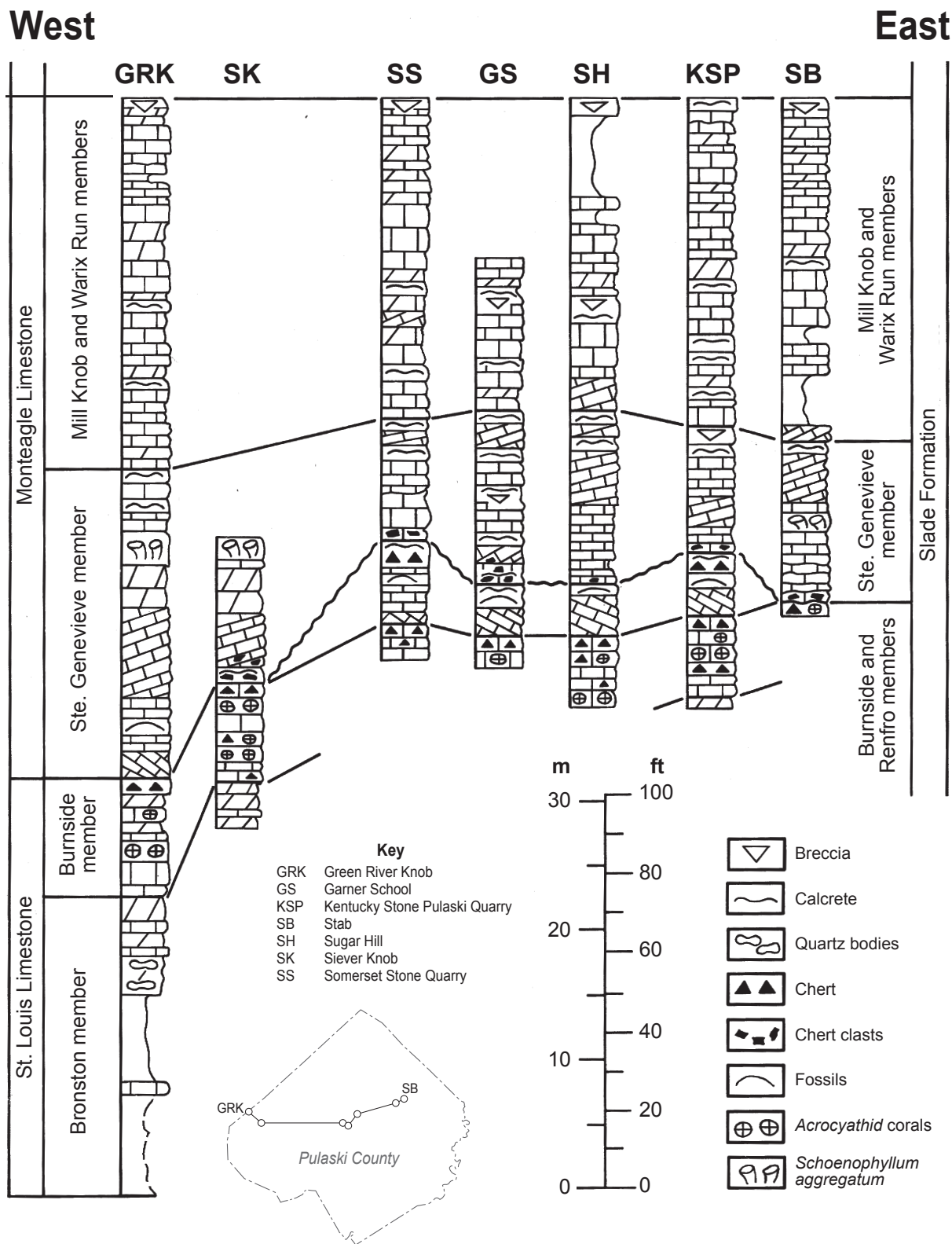


Figure 8. Cross section showing stratigraphic position of the *Schoenophyllum aggregatum* Zone east of the Cincinnati Arch in the Monteagle Limestone and Slade Formation of south-central Kentucky. Modified from Dever (1999, Fig. 26).

Pulaski County (Butts, 1922; Smith and others, 1973; Dever, 1999) and Wayne County (Lewis and Taylor, 1976; Lewis, 1977; Taylor, 1977). In Pulaski County, the coral zone occurs about 20 ft below the top of the Ste. Genevieve in both the Green River Knob Quarry on the western border of the county and in outcrops near Stab (Appendix 9) in the eastern part of the county (Fig. 8) (Dever, 1999). In a report on the Monteagle Limestone, Lewis (1971) noted that the coral commonly is concentrated in a single layer about 30 ft above the base of the Ste. Genevieve Limestone Member and that a few individual corallites are scattered elsewhere in the member. The possible discrepancy between reported positions of the coral zone, one about 20 ft below the top of the Ste. Genevieve and the other about 30 ft above the base, may be related to the varied thickness of the member as mapped in the area. Reported thicknesses of the Ste. Genevieve on geologic quadrangle maps range from 70 to 85 ft in Clinton County, 40 to 130 ft in Wayne County, and 30 to 115 ft in Pulaski County.

Along Pine Mountain in southeastern Kentucky, the coral has been reported from the Newman Limestone of Bell County (Butts, 1922) and Letcher County (Dever and others, 1992). In Letcher County, a large colony of *S. aggregatum* in growth position was found in the lower member of the Newman Limestone in the southwestern part of the Jenkins Quarry. Its position within the lower member was not clear because of faulting in overlying limestones and limited exposures of underlying limestones. Characteristics of the enclosing limestone suggest that the coral is in the basal

part of the Taggard Red Member of Wilpolt and Marden (1959) or a short distance below the base. Wilpolt and Marden (1959) correlated the Taggard with the Ste. Genevieve.

Additional Occurrences

S. aggregatum also occurs in the Ste. Genevieve of southern Indiana (Malott, 1952) and northern Tennessee (Butts, 1922), but as noted by Swann (1963, p. 73), "it has not yet been found in Illinois." The coral is present in Idaho and Alberta and British Columbia, Canada (Sando and Bamber, 1985).

Summary

With its widespread distribution and narrow stratigraphic range in the Ste. Genevieve Limestone, the colonial rugose coral *S. aggregatum* is a practical stratigraphic marker for commercial and geologic investigations of the extensive limestone deposits formed by the Ste. Genevieve and enclosing limestone units in western Kentucky. *S. aggregatum* also occurs east of the Cincinnati Arch in rocks correlative with the Ste. Genevieve in the Monteagle Limestone and Slade Formation of south-central Kentucky and the Newman Limestone of southeastern Kentucky.

Acknowledgments

Through correspondence and conversations, the late William J. Sando, U.S. Geological Survey, shared his knowledge of Mississippian corals. George W. Ellsworth Jr. and Jack R. Moody, former Kentucky Geological Survey staff geologists, participated in the field investigations.

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Appendix 1: Measured section at Yager Materials Riverside Mine, Meade County. Preston McGrain and Frank H. Walker, 1955; Garland R. Dever Jr., 1980.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
		Paoli Limestone Limestone outcrops in hillside above mine adit; bioclastic limestone in upper part; lower part commonly covered.
12	1.5	Popcorn Sandstone Bed Sandstone, light olive-gray, very fine- to medium-grained, with calcareous cement; few scattered carbonate grains; one bed.

11	10	Ste. Genevieve Limestone Limestone, light olive-gray, very fine- to very coarse-grained, bioclastic (commonly micrite-enveloped grains), peloidal; dark yellowish brown, rubbly at top; trace of pyrite; medium- to thick-bedded. No samples from interval 58–66 ft.
10	7	Top of mine adit at top of ledge. Limestone, very light olive-gray to light olive-gray, micrograined and very fine- to very coarse-grained, bioclastic; sparsely fossiliferous (brachiopods); dolomitic, siliceous, and argillaceous in lower 2 ft; medium-bedded; 4-in. green shale at top.
9	6	Limestone, light olive-gray, fine- to coarse-grained, oolitic, bioclastic (mainly micrite-enveloped grains); pale yellowish brown to dark yellowish brown, partly micrograined, with stringers of micrograined calcrete at top of ledge; conglomeratic in lower foot; fossiliferous (colonial coral, <i>Schoenophyllum aggregatum</i> , in interval 45–46 ft); medium- to thick-bedded; 3-in. green shale at top.
8	5	Limestone, light olive-gray, medium- to very coarse-grained, bioclastic (in part micrite-enveloped grains), intraclastic, in very fine- to fine-grained matrix; dark yellowish brown, with brecciated appearance, at top; stringers of pale yellowish brown to dusky yellowish brown, micrograined calcrete in upper 3 ft; detrital quartz silt; thick- to medium-bedded; 1-in. shale at top.
7	2	Limestone, light olive-gray to olive-gray, micrograined, brecciated; with green shale; rubbly-bedded. No samples.
6	9	Limestone, very light olive-gray, micrograined, with coarser bioclastic grains; in part oolitic, bioclastic (in part micrite-enveloped grains), peloidal; fossiliferous (crinoid plates); dolomitic, yellowish brown, very finely crystalline in interval 32–35 ft; medium- to thick-bedded.
5	5	Limestone, very light olive-gray to light olive-gray, fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains), oolitic; in part micrograined, with coarser bioclastic grains; fossiliferous (bryozoans, brachiopods, crinoids, and gastropods); medium-bedded.
4	1	Dolomite, yellowish brown, very finely crystalline; slightly argillaceous; one bed.
3	6	Limestone, very light olive-gray, fine- to very coarse-grained, crystalline, bioclastic (in part micrite-enveloped grains); sparsely oolitic; fossiliferous (crinoids and brachiopods); medium-bedded, with few shale partings in upper part.
2	8	Limestone, very light gray, fine- to very coarse-grained, bioclastic (mainly micrite-enveloped grains); fossiliferous (crinoids, brachiopods, and fish teeth); yellowish orange, dolomitic in upper foot; thick-bedded.
1	7	Limestone, very light olive-gray, fine- to coarse-grained, oolitic, bioclastic (mainly micrite-enveloped grains), peloidal; locally very finely crystalline dolomitic matrix; slightly fossiliferous (crinoids, brachiopods, bryozoans, and gastropods); thick-bedded. Base of sampled section, May 13, 1955.

B	4	Dolomite, yellowish brown to grayish orange, finely crystalline.

Appendix 1: Measured section at Yager Materials Riverside Mine, Meade County. Preston McGrain and Frank H. Walker, 1955; Garland R. Dever Jr., 1980.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
A	6	Limestone, light olive-gray, very fine- to coarse-grained, bioclastic (commonly micrite-enveloped grains), peloidal; sparsely oolitic; few very thin seams of micrograined limestone; few seams of very finely crystalline dolomite. Mine floor inside adit, October 3, 1980.

Appendix 2: Measured section at Litter's Irvington Quarry, Breckinridge County. Garland R. Dever Jr., George W. Ellsworth Jr., and Jack R. Moody, 1976, 1977, and 1981.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
12	2	Paoli Limestone Limestone, pale yellowish brown, micrograined to medium-grained, bioclastic (in part micrite-enveloped grains); sparsely fossiliferous (brachiopods); medium- to thin-bedded.
11	2	Dolomite and dolomitic limestone, yellowish gray to light olive-gray, microcrystalline to very finely crystalline, earthy, siliceous; scattered bioclastic grains; speckled with grayish red crystals.

10	4.5	Ste. Genevieve Limestone Limestone, light gray to light brownish gray, fine- to coarse-grained, oolitic, bioclastic (mainly micrite-enveloped grains); fossiliferous (crinoids and brachiopods); stringers of micrograined calcrete, in part silicified, in upper 1.5 ft; thin zone of brecciated micrograined limestone at top; medium- to thin-bedded.
9	3	Limestone, light gray, micrograined to medium-grained, bioclastic (in part micrite-enveloped grains); fossiliferous (crinoids and brachiopods); medium- to thin-bedded.
8	2	Limestone, light gray, micrograined to fine-grained, bioclastic (in part micrite-enveloped grains); fossiliferous (crinoids); thin, irregular beds.
7	4	Limestone, light gray, fine- to medium-grained, oolitic, bioclastic (mainly micrite-enveloped grains); partly micrograined in upper foot; fossiliferous (crinoids, including <i>Platycrinites penicillus</i> , blastoids, gastropods, and brachiopods); peloidal, intraclastic limestone containing clasts of calcrete in basal 4 in.; massive; laterally crossbedded.
6	6	Limestone, light gray to light olive-gray, micrograined to medium-grained, bioclastic (in part micrite-enveloped grains), partly oolitic, partly intraclastic; stringers of micrograined calcrete, in part silicified, in upper 5 ft; shaly, rubbly breccia in upper 3 to 4 in.; thin shale at top.
5	5	Limestone, pale yellowish brown to light olive-gray, micrograined to very fine-grained; fossiliferous (abundant remains of colonial coral, <i>Schoenophyllum aggregatum</i>); thin irregular beds with argillaceous partings. Mound-like bodies of pale yellowish brown, very finely crystalline dolomite occur laterally in ledge. No sample from covered interval, 30–31 ft.
4	5	Dolomitic limestone, grayish orange to yellowish gray, microcrystalline to very finely crystalline, slightly silty and argillaceous; fossiliferous in basal foot (colonial coral, <i>S. aggregatum</i>); stylolitic contact at base; 1- to 2-in. shale at top. Dolomitic limestone pinches out laterally. Ledge consists of oolitic and bioclastic limestone at west end of quarry.
3	2	Limestone, light olive-gray, fine- to medium-grained, bioclastic (mainly micrite-enveloped grains), oolitic; one bed.
2	3	Limestone, light olive-gray to light gray, fine- to coarse-grained, bioclastic (mainly micrite-enveloped grains), slightly oolitic; stylolitic contact at base; one bed.

Appendix 2: Measured section at Liter's Irvington Quarry, Breckinridge County. Garland R. Dever Jr., George W. Ellsworth Jr., and Jack R. Moody, 1976, 1977, and 1981.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
1	17	Limestone, pinkish gray to very light gray, medium-grained, oolitic, slightly bioclastic (mainly micrite-enveloped grains); stylolitic; massive appearance; crossbedded. Base of sampled section and floor of east (upper) quarry, May 5, 1976.
	55	Soil and weathered limestone exposed in slope between floor of east (upper) quarry and top of west (lower) quarry.
J	2.5	Dolomite, light olive-gray, very finely crystalline, earthy; burrowed; veinlets and blebs of calcite; medium-bedded. Top ledge of west quarry.
I	11.5	Limestone interlayered with dolomite; thick- to thin-bedded. Limestone, very light gray, fine- to coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic. Dolomite, light olive-gray, very finely crystalline; scattered bioclastic grains.
H	4.5	Dolomite, light olive-gray, very finely crystalline; scattered bioclastic grains; burrowed; in part limestone, very finely crystalline and bioclastic; medium-bedded.
G	4.5	Dolomite, medium light olive-gray, microcrystalline to very finely crystalline; scattered bioclastic grains and fossils (brachiopods and horn corals) in upper part; vugs filled with pink and white crystalline dolomite and purple and yellow fluorite in basal foot; massive.
F	3	Limestone, light olive-gray, fine- to coarse-grained, oolitic, bioclastic (micrite-enveloped grains); in part very finely crystalline dolomite; medium-bedded.

E	3	Horse Cave Member of St. Louis Limestone (Pohl, 1970) Dolomite, light olive-gray, very finely crystalline; abundant algal balls; vugs filled with calcite, fluorite, and gypsum near middle of unit; traces of pyrite; stylolitic; medium-bedded.
D	7	Dolomite, light olive-gray, very finely crystalline, earthy; scattered bioclastic grains and fossils (brachiopods); in part bioclastic limestone; abundant algal balls in basal foot; stylolitic; thick- to medium-bedded.
C	7	Limestone, light olive-gray, very fine- to coarse-grained, partly laminated, bioclastic (in part micrite-enveloped grains); partly dolomitized and thin-bedded in upper foot; massive appearance, crossbedded.
B	2	Limestone, medium light gray; fine- to coarse-grained in upper foot; dominantly micrograined with thin zones of fine- to coarse-grained in lower foot; fossiliferous (bryozoans, brachiopods, and crinoids; colonial coral, <i>Syringopora</i> , at top); medium-bedded.
A	9	Lost River Chert Bed Limestone, medium light gray, fine- to coarse-grained; in part micrograined; fossiliferous (bryozoans, brachiopods, crinoids, gastropods, and echinoids; <i>Syringopora</i> and <i>P. penicillus</i> at top); medium- to thick-bedded; four zones of light- to medium-gray, fossiliferous chert, 4 in. to 1 ft thick. Floor of west (lower) quarry, April 16, 1981.

Appendix 3: Measured section at Hanson Aggregates Upton Quarry, Hardin County. Garland R. Dever Jr., 1986.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
	3+	Sample Sandstone Sandstone, fine- to medium-grained; deeply weathered.
	8	Sandstone, light olive-gray, fine- to medium-grained; burrowed; thick-bedded; thin-bedded at top.
	5	Sandstone, light greenish gray, very fine- to fine-grained, shaly; very thin-bedded with inter-bedded shale.

	6.5	Beaver Bend and Paoli Limestones Ledge commonly inaccessible; description based on limited inspection. Limestone, light olive-gray to pale yellowish brown, very fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains); in part in very finely crystalline dolomitic matrix; fossiliferous (bryozoans, brachiopods, crinoids, blastoids, and horn corals); medium-bedded; argillaceous parting at base.
	2.5	Limestone, light olive-gray to medium olive-gray, fine- to very coarse-grained, bioclastic; fossiliferous (brachiopods); medium- to thin-bedded; argillaceous parting at base.
	3.5	Limestone, medium olive-gray to light olive-gray and pale yellowish brown to very pale grayish orange, fine- to very coarse-grained, bioclastic; commonly in very finely crystalline dolomitic matrix; thick- to medium-bedded; argillaceous parting at 1 ft above base.
	2.5	Limestone, light olive-gray, fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains); sparsely fossiliferous (brachiopods); thick- to medium-bedded; argillaceous partings at base and 1.5 ft above base.
	2	Limestone, light olive-gray, micrograined in lower part; grades upward into limestone, pale yellowish brown to grayish orange, fine- to very coarse-grained, bioclastic; commonly in very finely crystalline dolomitic matrix; sparsely fossiliferous (brachiopods); one bed; argillaceous partings.
	1	Dolomitic limestone, light olive-gray to medium light gray, microcrystalline to very finely crystalline; scattered bioclastic grains; fossiliferous (brachiopods); one bed.
	2.5	Shale, greenish gray to medium light gray.
	2.5	Covered interval: talus at base of face.
	1	Limestone, medium olive-gray, fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains); locally in micrograined matrix; fossiliferous (crinoids and brachiopods); thin-bedded; green-gray shaly partings.
	2	Limestone, medium olive-gray to light olive-gray, micrograined to very fine-grained; scattered bioclastic grains; small pockets of bioclastic, micrite-enveloped, and oolitic grains in basal part; fossiliferous (brachiopods, gastropods, crinoids, and burrows); medium- to thick-bedded.
	0.5	Limestone, medium yellowish brown to dark yellowish brown, very fine- to coarse-grained, bioclastic (in part micrite-enveloped grains); in part micrograined; sparry root tube with calcrete coating; rubbly- to nodular-bedded; 1- to 2-in. greenish gray shale at top. Shale thickens to 1 ft laterally along face.
	4	Limestone, light olive-gray, very fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains); fossiliferous (crinoids and gastropods); limestone in upper 2 to 3 in., pale yellowish brown to medium yellowish brown, in part micrograined, with few stringers of micrograined calcrete; medium- to thick-bedded.
	8	Limestone, light olive-gray to very light olive-gray, very fine- to very coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic; fossiliferous (crinoids and colonial corals); thick- to thin-bedded; argillaceous parting at base.
	1.5	Limestone, light olive-gray, very fine- to very coarse-grained, bioclastic; medium- to thin-bedded.

Appendix 3: Measured section at Hanson Aggregates Upton Quarry, Hardin County. Garland R. Dever Jr., 1986.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
	3.5	Limestone, very light olive-gray to light olive-gray, very fine- to very coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic; thick- to thin-bedded.
	1.5	Limestone, medium olive-gray to light olive-gray, fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains), peloidal; sparsely fossiliferous (brachiopods); scattered crystalline pyrite; medium-bedded; few greenish gray argillaceous partings in lower part.
	1.5	Limestone, medium yellowish brown, micrograined; scattered bioclastic grains and small fossil fragments; small pockets and thin seams of bioclastic and micrite-enveloped grains; thin to very thin, slightly irregular beds; greenish gray argillaceous partings.
	3.25	Limestone, light olive-gray to very light olive-gray, fine- to coarse-grained, bioclastic (in part micrite-enveloped grains); 2- to 3-in. zone of burrowed limestone with argillaceous and dolomitic appearance in upper part; scattered crystalline pyrite; thick-bedded to massive.
	0.5	Limestone, light olive-gray, micrograined; abundant bioclastic and micrite-enveloped grains; thin-bedded.
	0.5	Limestone, light olive-gray to medium olive-gray, very fine- to coarse-grained, bioclastic (in part micrite-enveloped grains); irregular pockets of micrograined limestone.
	0.5	Limestone, greenish gray, very fine- to very coarse-grained, peloidal, bioclastic (in part micrite-enveloped grains), intraclastic (in part calcrete) in microcrystalline to argillaceous matrix; very fine- to fine-grained quartz sand; crystalline pyrite.
	1.75	Limestone, light olive-gray to pale yellowish brown, very fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains); scattered dark carbonate grains; micrograined calcrete locally at top.
	0.5	Limestone, light olive-gray, micrograined; scattered bioclastic grains and dark carbonate grains; burrowed olive-gray, bioclastic limestone in lower part.
	2.25	Limestone, medium olive-gray, very fine- to coarse-grained, bioclastic (in part micrite-enveloped grains); scattered dark carbonate grains and granules; stringers of micrograined calcrete; pale yellowish brown bioclastic limestone with scattered intraclasts (in part calcrete) locally in top 1 to 2 in.; intraclastic in basal 1 to 2 in.; thick- to medium-bedded.
	6.5	Limestone, light olive-gray and light gray to medium light gray, micrograined; scattered bioclastic grains; sparsely fossiliferous (brachiopods and horn corals); vertical to subvertical fractures filled with bioclastic grains and greenish gray shale chips; limestone, medium olive-gray to light olive-gray, very fine- to medium-grained, bioclastic in lower 1.5 ft; chalcedonic spheres in interval 1- to 3-ft above base; scattered crystalline pyrite in lower 1.5 ft; thick-bedded; few greenish gray argillaceous partings in upper 5 ft.
	1.5	Limestone, light olive-gray, very fine- to coarse-grained, bioclastic (in part micrite-enveloped grains); one bed; very thin argillaceous parting at top.
	6.5	Limestone, light olive-gray, very fine- to coarse-grained, bioclastic; in part micrite-enveloped bioclastic and oolitic grains in lower 2 to 3 ft; 1- to 2-in. zones of micrograined limestone mainly in upper 1 to 2 ft; thick- to medium-bedded.
	1	Limestone, light olive-gray, micrograined, with very fine to coarse bioclastic grains; one bed.
	8	Dolomite, light gray, microcrystalline to very finely crystalline, earthy; scattered bioclastic grains; in part very pale yellowish brown to light olive-gray, very fine- to fine-grained bioclastic limestone; very light olive-gray, micrograined limestone in lower part; few chalcedonic spheres in upper foot; medium- to thick-bedded; covered intervals in lower part.
	0.5	Shale, greenish gray; beds of limestone, greenish gray to medium olive-gray, fine- to coarse-grained, bioclastic, intraclastic, argillaceous; scattered dark carbonate grains and granules; quartz silt and very fine-grained sand.

Appendix 3: Measured section at Hanson Aggregates Upton Quarry, Hardin County. Garland R. Dever Jr., 1986.		
Description		
Ledge Number	Thickness (ft)	Lithology
	1	Ste. Genevieve Limestone Limestone, medium yellowish brown, fine- to coarse-grained, bioclastic (in part micrite-enveloped grains); in part micrograined calcrite; nodular to rubbly bedded; greenish gray shale.
	5.5	Limestone, light olive-gray to very light olive-gray, fine- to coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic; irregular pockets and lenses of micrograined limestone in upper foot; stringers of micrograined calcrite in upper 1.5 ft; medium- to thin-bedded.
	5	Limestone, light olive-gray, micrograined; thin zones of very fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains); in part intraclastic in basal foot; thin-bedded; few argillaceous partings.
	4	Limestone, light olive-gray to medium olive-gray, very fine- to very coarse-grained, bioclastic; sparsely oolitic; stringers of micrograined calcrite, in part silicified; sparry root tubes with calcrite coating; thick- to medium-bedded; laterally crossbedded.
	3.5	Limestone, light olive-gray, micrograined; scattered bioclastic grains; vertical fractures filled with bioclastic grains; crystalline pyrite common; botryoidal quartz locally abundant; thin to medium, irregular to wavy beds; argillaceous. Dolomite, very pale yellowish brown, microcrystalline to very finely crystalline, massive, up to 3 ft thick, in lower part of ledge. Thicknesses of basal dolomite and upper limestone reciprocal. Dolomite apparently grades laterally into micrograined limestone.
	1	Limestone, light bluish gray to light greenish gray, very fine- to coarse-grained, peloidal, bioclastic; shaly to very argillaceous. In the shaly to argillaceous matrix, nodules of limestone, light olive-gray, fine- to coarse-grained, peloidal, bioclastic (micrite-enveloped grains), oolitic.
	4.5	Limestone, light olive-gray, fine- to coarse-grained, bioclastic (mainly micrite-enveloped grains), peloidal, oolitic; fossiliferous (colonial coral, <i>Schoenophyllum aggregatum</i>); medium-bedded.
	2	Dolomite, light gray, microcrystalline to very finely crystalline, earthy.
	5	Dolomite.
	13	Limestone, very light olive-gray, fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains), oolitic; fossiliferous (crinoids, including common <i>Platycrinites penicillus</i> , blastoids, and brachiopods); thick- to medium-bedded; crossbedded.
	5.5	Limestone, very light olive-gray to light olive-gray to light olive-gray, fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains); fossiliferous (crinoids and bryozoans); thick- to thin-bedded.
	2.5	Limestone, very light olive-gray to light olive-gray, fine- to very coarse-grained, bioclastic (few micrite-enveloped grains); fossiliferous (crinoids and bryozoans); dolomite, microcrystalline to very finely crystalline, earthy, in upper 3 in.; medium- to thin-bedded; argillaceous partings.
	0.5	Limestone, light olive-gray, very fine- to very coarse-grained, bioclastic (few micrite-enveloped grains); fossiliferous (crinoids, bryozoans, and brachiopods); limestone grades into very finely crystalline dolomite in upper 1 in.; one bed; argillaceous parting at top.
	2	Limestone, light olive-gray, very fine- to very coarse-grained, bioclastic (few micrite-enveloped grains), sparsely oolitic; fossiliferous (crinoids and bryozoans); in part dolomitic, very finely crystalline to microcrystalline in upper 4 in.; thick- to medium-bedded.
	2	Limestone, light olive-gray, micrograined; thin irregular zones of bioclastic limestone; thick- to medium-bedded.
	2.5	Limestone, light olive-gray to medium olive-gray, micrograined; irregular zones and lenses of bioclastic and oolitic limestone; limestone, fine- to coarse-grained, bioclastic in upper 6 to 8 in.; medium- to thin-bedded; 1-in. greenish gray shale at top.
	1.5	Limestone, very light olive-gray to light olive-gray, fine- to coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic; thin- to medium-bedded.

Appendix 3: Measured section at Hanson Aggregates Upton Quarry, Hardin County. Garland R. Dever Jr., 1986.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
	1.5	Limestone, light olive-gray, micrograined; scattered bioclastic grains; irregular zones of fine- to very coarse-grained, bioclastic limestone; one bed.
	2	Dolomite, light olive-gray to olive-gray, very finely crystalline to microcrystalline; locally relict micrite-enveloped grains; medium- to thin-bedded.
	5.5	Limestone, very light olive-gray, very fine- to medium-grained, bioclastic; limestone grades upward into dolomite, very light gray to yellowish gray, microcrystalline to very finely crystalline, earthy, with scattered bioclastic grains (dominant lithology of upper 2 ft); stylolites; thick-bedded.
	5	Limestone, light olive-gray to medium olive-gray, fine- to very coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic, intraclastic; irregular zones of micrograined limestone; stringers of micrograined calcrete in upper 1.5 ft; thick-bedded; argillaceous limestone to calcareous shale in upper 1 to 3 in.
	6	Limestone, very light olive-gray to light olive-gray, fine- to coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic, peloidal; micrograined limestone and laterally microcrystalline to very finely crystalline dolomite in upper 4 in.; thick-bedded; thin shale at 3 ft below top.
	5.5	Limestone, light olive-gray, very fine- to very coarse-grained, bioclastic, peloidal; fossiliferous (horn corals); medium- to thin-bedded.
	2	Limestone, medium yellowish brown to light olive-gray, very fine- to very coarse-grained, bioclastic; microcrystalline to very finely crystalline, dolomitic matrix in lower part; medium- to thin-bedded; thin argillaceous parting at top.
	3.5	Limestone, very light olive-gray to very light gray, fine- to medium-grained, bioclastic (mainly micrite-enveloped grains), oolitic; very finely crystalline, dolomitic matrix at top and in basal foot; medium- to thin-bedded.
	3	Dolomite, pale yellowish brown, very finely crystalline to microcrystalline; thick- to medium-bedded.
	1.5	Limestone, very light gray to white, fine- to coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic; very finely crystalline matrix in upper 2 to 3 in.; thick-bedded.
	1	Covered interval between base of north quarry face and top of small pit in east quarry.
	2.5	Limestone, very light olive-gray to light olive-gray, fine- to very coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic, peloidal; fossiliferous (solitary and colonial corals, including <i>Syringopora</i>); very finely crystalline to microcrystalline dolomite in upper 2 in.; medium- to thin-bedded.

	4	Horse Cave Member of St. Louis Limestone (Pohl, 1970) Dolomite, very light olive-gray to light olive-gray, very finely crystalline; microcrystalline, earthy dolomite in upper 1.25 ft; medium-bedded.
	2	Limestone, very light olive-gray, very fine- to very coarse-grained, bioclastic; fossiliferous (crinoids and bryozoans); bioclastic (mainly micrite-enveloped grains) and oolitic in upper 8 in.; medium- to thin-bedded.
	1.5	Covered interval: limestone talus.
	10.5	Lost River Chert Bed Limestone, very light olive-gray to very light gray, very fine- to very coarse-grained, bioclastic; fossiliferous (crinoids, fenestrate bryozoans, and brachiopods); medium- to thin-bedded; zone of irregular and tabular bodies of very light olive-gray to very light gray, fossiliferous (bryozoans and brachiopods) chert in interval 1.25 to 2.25 ft below top; scattered irregular to tabular bodies and nodules of chert in underlying 7 ft. Base of measured section: floor of small pit in east quarry, March 1986.

Appendix 4: Measured section at Hart County Stone Horse Cave Quarry, Hart County. Garland R. Dever Jr., 1986.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
		Big Clifty Sandstone Member of Golconda Formation Loose blocks of sandstone on upper hillside.
		Girkin Formation: Beech Creek Limestone equivalent(?) Small loose slabs of limestone resting on shale and dolomite. Limestone, very light gray to light olive-gray and yellowish gray, micrograined to very coarse-grained, bioclastic (in part micrite-enveloped grains); sparsely intraclastic; fossiliferous (crinoids and brachiopods).
	0.5	Girkin Formation: Elwren Sandstone equivalent(?) Shale, greenish gray.
	3.75	Girkin Formation: Reelsville Limestone equivalent Dolomite, deeply weathered, very pale orange to grayish orange, microcrystalline, earthy; in part coarsely crystalline; relict breccia texture in interval, 1 to 1.5 ft above base; thick-bedded to massive.
	1.5	Limestone, pale yellowish brown to light olive-gray, very fine- to coarse-grained, bioclastic (in part micrite-enveloped grains); fossiliferous (crinoids, including <i>Pterotocrinus</i>); medium- to thin-bedded; laterally replaced by dolomite, yellowish brown to yellowish orange, microcrystalline to very finely crystalline, earthy.
	8	Limestone, medium yellowish brown, very fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains); sparsely oolitic; fossiliferous (crinoids, including <i>Pterotocrinus</i> and <i>Talarocrinus</i> , blastoids, and horn corals); medium- to thin-bedded.
	5	Limestone in upper and lower parts of ledge separated by 1.75-ft interval of dolomite. Limestone, light olive-gray to medium olive-gray and medium yellowish brown, very fine- to very coarse-grained, bioclastic (commonly micrite-enveloped grains); sparsely oolitic; fossiliferous (crinoids, including <i>Agassizocrinus</i> and <i>Pterotocrinus</i> , brachiopods, horn corals, and blastoids); thick- to medium-bedded. Dolomite, grayish orange to medium yellowish brown, microcrystalline to very finely crystalline; scattered bioclastic grains; thick- to medium-bedded; locally grades into bioclastic limestone.
	0.5	Limestone, medium yellowish brown, very fine- to medium-grained, bioclastic (in part micrite-enveloped grains); deeply weathered, earthy dolomite in upper 2 in.
	4.5	Limestone, medium yellowish brown, very fine- to very coarse-grained, bioclastic (commonly micrite-enveloped grains); fossiliferous (crinoids); medium- to thin-bedded; crossbedded.
	4.5	Covered slope: limestone talus and soil.
	2.5	Top ledge of small abandoned quarry. Limestone, light olive-gray to very light olive-gray and yellowish brown, very fine- to coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic; grades downward into dolomite, yellowish brown to grayish orange, very finely crystalline; one bed.
	1	Dolomite, very pale yellowish brown to pale grayish orange, microcrystalline, earthy; scattered bioclastic grains; bioclastic limestone, with dolomitic matrix, in basal 3 to 4 in.; one bed.
	6.5	Limestone, very light gray to very light olive-gray, very fine- to very coarse-grained, bioclastic (commonly micrite-enveloped grains), in chalky matrix; fossiliferous (crinoids and brachiopods); thick- to medium-bedded.
	5	Limestone, medium olive-gray to light olive-gray, bioclastic (commonly micrite-enveloped grains), oolitic; thick- to thin-bedded.

Appendix 4: Measured section at Hart County Stone Horse Cave Quarry, Hart County. Garland R. Dever Jr., 1986.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
	4.5	Top ledge of active quarry. Dolomitic limestone, light olive-gray to yellowish gray and grayish orange, microcrystalline to very finely crystalline; scattered bioclastic grains; fossiliferous (crinoids and brachiopods); burrowed; thin- to thick-bedded.
	6.5	Limestone, light olive-gray to medium olive-gray, micrograined to very coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic; in part fossiliferous (crinoids, including <i>Tal-arocrinus</i> , brachiopods, and gastropods); in part burrowed; abundant very fine-grained quartz sand in limestone in lower half of ledge (in part as zones of calcareous sandstone); thick- to thin-bedded.
	1	Girkin Formation: Sample Sandstone equivalent Shale, moderate olive-brown to dusky yellow, semiblocky, silty to sandy; sandstone, very light gray, very fine-grained, 0.5 to 1 in. thick, at 1 to 1.5 in. below top.
	6	Girkin Formation: Beaver Bend and Paoli Limestones equivalent Breccia, deeply weathered, dusky yellowish brown, micrograined limestone clasts in light gray, earthy matrix; common vadoids; very fine-grained quartz sand in uppermost part; textures in lower part locally range from earthy and microcrystalline to granular (very fine- to medium-grained with very fine-grained quartz sand); massive.
	1.5	Limestone, medium yellowish brown, very fine- to very coarse-grained, bioclastic (mainly micrite-enveloped grains), partly oolitic; stringers of micrograined calcrete (commonly silicified); medium- to thin-bedded.
	4.5	Limestone, light olive-gray to medium olive-gray, very fine- to very coarse-grained, bioclastic (commonly micrite-enveloped grains); in part in micrograined matrix; fossiliferous (colonial corals); medium- to thin-bedded.
	6.5	Limestone, light olive-gray to medium olive-gray, very fine- to very coarse-grained, bioclastic (commonly micrite-enveloped grains), oolitic; fossiliferous (brachiopods, gastropods, and horn corals); thick- to thin-bedded.
	5	Limestone, light olive-gray to very light olive-gray, fine- to very coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic; limestone in upper 2 ft interlayered with thin bands of dolomite, grayish orange to medium yellowish brown, microcrystalline to very finely crystalline (scattered bioclastic grains); medium-bedded.
	4	Dolomite, very pale orange to yellowish gray, microcrystalline to very finely crystalline; scattered bioclastic grains; in part limestone, light olive-gray, micrograined (scattered bioclastic grains) in irregular layers, lenses, and pods; thick- to medium-bedded.
	3.5	Limestone, light olive-gray to medium olive-gray, fine- to coarse-grained, bioclastic (in part micrite-enveloped grains); in part in dolomitic and micrograined matrixes in basal 8 in.; medium- to thin-bedded.
	2.5	Limestone, medium olive-gray to medium yellowish brown, micrograined; scattered bioclastic grains; interlayered with dolomite, microcrystalline to very finely crystalline (scattered bioclastic grains); interlaminated limestone and dolomite in basal part; medium- to very thin-bedded; 1.5-in. shale at top.
	2	Limestone, dark yellowish brown, fine- to coarse-grained, peloidal, bioclastic, in slightly argillaceous matrix; greenish gray, argillaceous to slightly shaly in upper 2 in.; thick- to medium-bedded.
	3.5	Limestone, medium yellowish brown to dark yellowish brown, very fine- to coarse-grained, laminated, bioclastic (in part micrite-enveloped grains); stringers of micrograined calcrete and calcrete-coated root tubes; very thin greenish gray, argillaceous seams in upper foot; thick- to medium-bedded.

Appendix 4: Measured section at Hart County Stone Horse Cave Quarry, Hart County. Garland R. Dever Jr., 1986.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
	3.5	Limestone, light olive-gray to dark yellowish brown, micrograined; scattered bioclastic grains; brecciated in upper 3 to 9 in.; stringers of micrograined calcrete in upper 3 ft; calcrete-coated root tubes at top; limestone, very fine- to medium-grained, bioclastic, in 2-in.-wide vertical seams (fractures?) and related horizontal seams; indistinct bedding.
	7.5	Limestone, very light olive-gray to medium olive-gray; dark yellowish brown in upper part; very fine- to very coarse-grained, bioclastic (commonly micrite-enveloped grains); few micrograined clasts in lower part; thick- to medium-bedded.
	6.5	Limestone, very light gray to pale yellowish brown, fine- to very coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic; partly in very finely crystalline dolomitic matrix in upper part; stylolites; thick-bedded.
	3.5	Limestone, very light olive-gray to very light gray, very fine- to medium-grained, bioclastic (mainly micrite-enveloped grains), peloidal; medium- to thin-bedded.
	5.5	Limestone, very light olive-gray, micrograined to microcrystalline; scattered bioclastic grains; grades upward into limestone, very fine- to fine-grained, bioclastic (in part micrite-enveloped grains), peloidal, in upper 1.5 to 2 ft; small spheroidal bodies of crystalline quartz in lower 3 ft; stylolites; thick-bedded.
	7.5	Limestone, light olive-gray, micrograined to microcrystalline; scattered bioclastic grains; sub-conchoidal fracture; stylolites; thick- to thin-bedded.
	1.5	Limestone, greenish gray, fine- to coarse-grained, peloidal, in argillaceous matrix; scattered micrograined clasts; very fine-grained quartz sand; quasi-polygonal pattern of vertical quartz veins visible in unit on bench floor.

	2.5	Ste. Genevieve Limestone Limestone, medium yellowish brown to very dark yellowish brown and light olive-gray, micrograined; scattered bioclastic grains; brecciated in upper 0.5 to 1 ft; stringers of micrograined calcrete and vadoids in upper 2 ft.
	5	Limestone, olive-gray to light olive gray, fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains), oolitic, peloidal; thin discontinuous seams of micrograined limestone; thin- to thick-bedded.
	7.25	Limestone, medium olive-gray to light olive-gray and very light gray, very fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains), oolitic, in earthy matrix; in part micrograined; traces of quartz silt; thin discontinuous bands and small irregular bodies of chert; medium- to thin-bedded.
	4.5	Inaccessible interval; description mainly based on talus. Limestone, light olive-gray to very light olive-gray, micrograined; scattered bioclastic grains; in part very fine- to coarse-grained, bioclastic, in micrograined matrix; traces of quartz silt; shaly zones visible in face; thick- to thin-bedded.
	2.25	Limestone, light olive-gray to medium olive-gray, very fine- to coarse-grained, peloidal, bioclastic (in part micrite-enveloped grains); scattered micrograined clasts; in part thin micrograined stringers at top; shaly at top; thick- to thin-bedded.
	8.5	Limestone, very light gray to medium light gray, micrograined to microcrystalline; scattered bioclastic grains; in part interlayered with thin zones of limestone, fine- to very coarse-grained, bioclastic in micrograined matrix; interlaminated micrograined limestone and earthy dolomite in basal 2 to 3 in.; sparsely fossiliferous (brachiopods, in part silicified); locally thin discontinuous chert bands in upper foot; scattered pyrite crystals; shaly in lower 4 to 5 in.; thin to medium irregular beds; in part weathers very shaly.
	2.5	Limestone, very light olive-gray to medium olive-gray, very fine- to very coarse-grained, bioclastic, in very finely crystalline matrix; fossiliferous (crinoids and brachiopods); dolomite, light olive-gray to olive-gray, microcrystalline in lower foot; quartz silt and very fine-grained sand; medium- to thin-bedded; few thin, irregular, shaly partings in lower part.

Appendix 4: Measured section at Hart County Stone Horse Cave Quarry, Hart County. Garland R. Dever Jr., 1986.		
Description		
Ledge Number	Thickness (ft)	Lithology
	2	Limestone, light olive-gray to medium olive-gray, very fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains), oolitic; thick- to medium-bedded.
	5.5	Limestone, light olive-gray, fine- to very coarse-grained, bioclastic (micrite-enveloped grains), oolitic; fossiliferous (crinoids, blastoids, and brachiopods; scattered corralites of colonial coral, <i>Schoenophyllum aggregatum</i> , mainly in upper part); thick-bedded; crossbedded.
	3.5	Limestone, light olive-gray to medium olive-gray, very fine- to very coarse-grained, bioclastic; in part in very finely crystalline dolomitic matrix; interlayered in upper part with zones of dolomitic limestone, medium light gray, very finely crystalline (scattered bioclastic grains); medium- to thin-bedded.
	4.5	Limestone, medium olive-gray to medium yellowish brown, very fine- to very coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic; sparsely fossiliferous (fenestrate bryozoans); medium- to thin-bedded.
	2.5	Dolomite, very light olive-gray and very pale orange to very pale yellowish brown, microcrystalline to very finely crystalline, slightly earthy; one bed; forms recess; prominent unit in quarry face.
	2	Limestone, light olive-gray to medium olive-gray, fine- to coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic; scattered micrograined clasts; stringer of micrograined calcrite at 9 in. above base; one bed; laterally medium- to thin-bedded.
	3	Limestone, light olive-gray to medium olive-gray, very fine- to very coarse-grained, bioclastic; irregularly interlayered with medium olive-gray, micrograined limestone (scattered bioclastic grains); mainly micrograined limestone in upper 3 to 4 in.; sparsely fossiliferous (brachiopods); thick- to thin-bedded.
	4.5	Limestone, medium olive-gray to light olive-gray, very fine- to very coarse-grained, bioclastic; in part micrograined (scattered bioclastic grains); slightly argillaceous in upper foot; fossiliferous (brachiopods); abundant irregular bodies and nodules of chert in upper foot; indistinct bedding.
	1.5	Limestone, light olive-gray to medium olive-gray, fine- to very coarse-grained, bioclastic (mainly micrite-enveloped grains), sparsely peloidal; thin- to medium-bedded; 1-in. shale at top.
	1	Dolomite, very light gray, microcrystalline to very finely crystalline, earthy; scattered quartz silt and very fine-grained sand; one bed.
	4.5	Dolomite, very light olive-gray, microcrystalline to very finely crystalline, slightly earthy; sparse bioclastic grains; stylolites; massive to thick-bedded.
	3.5	Limestone, light olive-gray, micrograined, scattered bioclastic grains; interlayered with thin bands of dolomite, very pale yellowish brown, microcrystalline to very finely crystalline in upper 2 ft; very fine- to coarse-grained bioclastic limestone in basal 2 to 3 in.; thin- to medium-bedded.
	0.5	Limestone, light olive-gray, very fine- to medium-grained, bioclastic; in greenish gray argillaceous matrix in upper 2 in.; greenish gray shale in middle 2 in.; very thin-bedded.
	3.5	Limestone, medium olive-gray to light olive-gray, very fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains); in part in micrograined matrix; small micrograined clasts in basal part; interlayered with very thin shales in basal 3 in.; thick- to medium-bedded.
	10	Limestone, very light gray to light olive-gray, fine- to very coarse-grained bioclastic (mainly micrite-enveloped grains), oolitic; 4- to 6-in. band of dolomite, medium olive-gray, very finely crystalline to microcrystalline at 3 ft above base; thick- to thin-bedded.
	3	Dolomite, light olive-gray to very light olive-gray, very finely crystalline to microcrystalline, slightly earthy; scattered bioclastic grains near middle; stylolites; medium-bedded.
	2	Dolomite, olive-gray to light olive-gray, microcrystalline to very finely crystalline, slightly earthy; few scattered bioclastic grains; one bed.

Appendix 4: Measured section at Hart County Stone Horse Cave Quarry, Hart County. Garland R. Dever Jr., 1986.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
	2	Dolomite, medium olive-gray to olive-gray, very finely crystalline to microcrystalline, slightly earthy; scattered bioclastic grains; medium- to thin-bedded, with argillaceous partings.
	3.5	Dolomite, light olive-gray to medium olive-gray, microcrystalline to very finely crystalline, slightly earthy; thick- to thin-bedded; very thin shale at base.
	2	Dolomite, light olive-gray, very finely crystalline; scattered bioclastic grains (in part micrite-enveloped grains); thick- to medium-bedded.
	1	Limestone, very light olive-gray, fine- to coarse-grained, oolitic, bioclastic (micrite-enveloped grains); medium- to very thin-bedded.
	2	Dolomite, light olive-gray, microcrystalline to very finely crystalline, slightly earthy; scattered bioclastic grains; thick- to medium-bedded; very thin shale at base; irregular basal contact.
	4.5	Limestone, very light gray, fine- to coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic; discontinuous pockets of very coarsely crystalline calcite 1 to 1.5 ft below top; thick- to medium-bedded.

	1.25	Horse Cave Member of St. Louis Limestone (Pohl, 1970) Dolomite, very light olive-gray to medium olive-gray, very finely crystalline to microcrystalline, slightly earthy; olive-gray, argillaceous, micrograined limestone at base; medium- to thin-bedded.
	1.25	Dolomite, light olive-gray to pale yellowish brown, very finely crystalline; scattered bioclastic grains; one bed.
	0.5	Dolomite, light olive-gray to pale yellowish brown, very finely crystalline to microcrystalline; in part slightly earthy; scattered bioclastic grains; local patches of bioclastic limestone in basal part; one bed; 1-in. olive-gray shale at top; very thin shale at base; irregular basal contact.
	1.5	Limestone, light olive-gray, very fine- to coarse-grained, bioclastic; sparsely fossiliferous (brachiopods); medium-bedded.
	4	Limestone, very light gray, speckled with light olive-gray grains; fine- to very coarse-grained, bioclastic; fossiliferous (bryozoans, including fenestrate forms, and crinoids); thick- to thin-bedded.
	0.5	Covered interval: talus at base of main quarry face.
	14	Lost River Chert Bed (upper part of ledge) Limestone, very light gray to light gray and light olive-gray (in part with speckled appearance), very fine- to very coarse-grained, bioclastic; fossiliferous (bryozoans, including fenestrate forms, brachiopods, and crinoids); thick- to thin-bedded; zones (6 to 8 in. thick) of bedded and irregular bodies of very light olive-gray to medium olive-gray mottled chert in interval 7 in. to 5.5 ft below top; scattered small nodules of chert locally in ledge.
	4.5	Limestone, medium olive-gray to light olive-gray, very fine- to coarse-grained, bioclastic; in part in very finely crystalline matrix; zone of small chert nodules at 2.5 to 3 ft below top; thin- to thick-bedded.
	13.5	Limestone, light olive-gray to olive-gray and very light gray (in part with speckled appearance), very fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains), peloidal; thick- to thin-bedded. Basal unit of Horse Cave Member of Pohl (1970)

	4.5	St. Louis Limestone Dolomite, medium yellowish brown, very finely crystalline; in part with scattered small vugs; scattered bioclastic grains in lower part; thick- to thin-bedded; very thin shale at top.
	1.5	Limestone, light olive-gray to olive-gray, very fine- to fine-grained, bioclastic, peloidal; irregular bodies of spicular chert; one bed.

Appendix 4: Measured section at Hart County Stone Horse Cave Quarry, Hart County. Garland R. Dever Jr., 1986.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
	1.5	Limestone, medium olive-gray to light olive-gray, very fine- to coarse-grained, bioclastic; in part in microcrystalline to micrograined matrix; abundant irregular bodies and spheroids of chert. Base of measured section: floor of pit at south end of quarry, April 1986.

Appendix 5: Measured section at abandoned Huckleberry Knob Quarry, Barren County. Kentucky Geological Survey staff geologists 1953, 1956, and 1979.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
		Top of abandoned quarry
	8	Girkin Formation Limestone; prominent parting at base of unit.
	22	Limestone; local silicified coral in upper part of unit; parting at base of unit.
6	8	Ste. Genevieve Limestone Limestone, light gray to medium light gray, fine- to medium-grained, oolitic; local silicified stringers of micrograined calcrite in upper part of ledge.
5	3	Limestone, light gray to medium light gray, micrograined, scattered flecks of crystalline calcite, conchoidal fracture; in part very fine- to medium-grained, slightly argillaceous limestone in upper foot; thin- to nodular-bedded with interbedded shale.
4	11	Limestone, medium gray to medium light gray, fine- to coarse-grained, bioclastic; in part oolitic, peloidal; stringers of micrograined calcrite in upper part; scattered thin stringers of chert throughout ledge; rare nodular chert; medium-bedded; locally thin-bedded.
3	2	Limestone, light gray to grayish orange, microcrystalline to very finely crystalline, dolomitic; in part shaly; locally granular limestone at top; scattered crystalline pyrite; thin- to thick-bedded with interbedded shale.
2	1	Limestone, medium gray to medium light gray, rounded grains and granules, peloidal, dolomitic, argillaceous; quartz silt and very fine-grained sand; thin shales at base and top.
1	18	Limestone, light gray to very light gray, medium- to fine-grained, oolitic; in part very finely to coarsely crystalline; fossiliferous (crinoid, <i>Platycrinites penicillus</i> ; scattered corallites, in part silicified, of colonial coral, <i>Schoenophyllum aggregatum</i> , in interval 9 to 13 ft above base); crossbedded; locally thin-bedded in upper 2 ft. Quarry floor, 1956.

Appendix 6: Measured section at Bluegrass Materials Barren River Quarry, Warren County. Harry W. Settle, 1949; Garland R. Dever Jr. and Jack R. Moody, 1979.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
		Top of upper face at west end of Gary Brothers Crushed Stone Co. quarry, 1979.
25	5	Girkin Formation Limestone, bioclastic (in part micrite-enveloped grains); fossiliferous (crinoids and corals); thick-bedded.

Appendix 6: Measured section at Bluegrass Materials Barren River Quarry, Warren County. Harry W. Settle, 1949; Garland R. Dever Jr. and Jack R. Moody, 1979.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
24	11	Limestone, bioclastic; in part in very finely crystalline dolomitic matrix; fossiliferous (crinoids, including <i>Talarocrinus</i> , and colonial corals); thick- to medium-bedded.
23	6.5	Dolomite, very finely crystalline, in upper part of ledge; very light colored, earthy in upper 2 ft; limestone, apparently interlayered micrograined and coarser-grained, in lower part of ledge; medium- to thin-bedded. Ledge partly inaccessible.
22	5	Limestone, mainly micrograined, in lower part; coarser-grained in upper part; peloidal, in part burrowed, in upper 2 in.; stringers of micrograined calcrete in upper 3 ft; indistinct bedding.
21	1	Dolomite, greenish gray, earthy, laminated, in lower part; grades upward into gray, highly burrowed dolomite; greenish gray shale parting at base.
20	6	Limestone, bioclastic (mainly micrite-enveloped grains), oolitic; well sorted; medium- to thick-bedded.
19	2.5	Limestone, light colored, micrograined, burrowed; appears partly dolomitic; one bed.
18	2	Limestone, gray, fine- to medium-grained, bioclastic (mainly micrite-enveloped grains), oolitic.
17	17	Top of face at east end of quarry, 1979. Limestone, bioclastic, with very finely crystalline to micrograined matrix; mainly micrograined limestone in upper 2.5 ft; fossiliferous (crinoids, including <i>Talarocrinus</i> , blastoids, including <i>Pentremites</i> , brachiopods, and horn corals); quartz rosettes common; thick- to medium-bedded. At west end of quarry, limestone dominantly oolitic and micrite-enveloped bioclastic grains.
16	4	Limestone, micrograined, sparsely fossiliferous (gastropods and brachiopods); thin- to medium-bedded.
15	12	Limestone, micrograined; interlayered with very fine- to fine-grained limestone; appears dolomitic or slightly argillaceous in lower 3 ft; sparsely fossiliferous (brachiopods); medium-bedded.
14	0.5	Limestone, brownish gray to light gray, micrograined; greenish gray shale with discontinuous lenses of micrograined limestone at top.
13	2	Limestone, peloidal; thin partings of greenish gray shale. Unit rests on irregular surface; laterally up to 4.5 ft thick.

12	6	Ste. Genevieve Limestone Limestone, micrograined, with lenses of coarser-grained limestone; brecciated in upper foot; irregular bodies and stringers of dark chert, in part containing fluorite, in lower 2.5 ft; medium- to thin-bedded.
11	4	Limestone, granular, mainly intraclastic (abundant clasts of micrograined limestone); gradational with underlying ledge; one bed.
10	5.5	Limestone, micrograined; thin irregular beds with argillaceous partings.
9	2.5	Limestone, peloidal, slightly argillaceous; in part micrograined at top; gradational with overlying ledge.
8	7	Limestone, peloidal with few lenses of oolitic and bioclastic (mainly micrite-enveloped grains) limestone in upper 4 ft; shale and very argillaceous peloidal limestone with abundant intraclasts in interval 1 to 2.5 ft above base; stringers of micrograined calcrete in upper 3 ft; thin shale partings in upper foot.
7	5	Limestone, medium-grained, bioclastic (mainly micrite-enveloped grains); thin-bedded, micrograined limestone at base.
6	9	Dolomite, very finely crystalline, slightly earthy, burrowed; limestone, oolitic and bioclastic (mainly micrite-enveloped grains), 0.5 to 1 ft thick, near middle of ledge.

Appendix 6: Measured section at Bluegrass Materials Barren River Quarry, Warren County. Harry W. Settle, 1949; Garland R. Dever Jr. and Jack R. Moody, 1979.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
5	5	Limestone, fine- to medium-grained, bioclastic (in part micrite-enveloped grains), peloidal; very thin shale partings; locally argillaceous dolomite and shale, 1 ft thick, at base; laterally bioclastic limestone at base.
4	21	Top of Lewis & Matthews Quarry, 1949. Limestone, light gray to gray, fine- to medium-grained, oolitic, crystalline; laterally dolomitic in upper 1 to 2 ft; fossiliferous at top (crinoid, <i>Platycrinites penicillus</i> ; corallites and colonies of coral, <i>Schoenophyllum aggregatum</i> , in upper 2 ft); thick-bedded. Upper 3 ft of ledge (weathered limestone) not sampled.
3	2	Dolomite and dolomitic limestone, light gray, fine-grained, dense.
2	2	Limestone, gray, coarse-grained, crystalline, oolitic; shaly; weathers bluish.
1	5	Limestone, light gray, fine-grained, oolitic; thick-bedded. Floor of Lewis & Matthews Quarry, Aug. 2, 1949.

Appendix 7: Measured section at Rogers Group Princeton Quarry, Caldwell County. Garland R. Dever Jr. and Jack R. Moody, 1979.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
		Top of measured section in smaller quarry north of main quarry and mine entry.
	2.5	Renault Limestone Limestone, very fine-grained, argillaceous; in part coarser-grained; thin peloidal zone at top; thin-bedded with thin shales.
	3	Limestone, peloidal; abundant intraclasts and argillaceous seams in basal 6 in.; massive.
	3.5	Levias Limestone Member of Ste. Genevieve Limestone Limestone, micrograined to very fine-grained; sparsely fossiliferous (crinoids); brecciated in upper 1.5 to 2 ft; massive.
	1.5	Limestone, micrograined, burrowed; small calcite blebs; fossiliferous (bryozoans, including fenestrate forms, brachiopods, and corals); thin-bedded with argillaceous partings.
	7	Limestone, micrograined; scattered bioclastic grains; fossiliferous (brachiopods and fenestrate bryozoans); in part dolomitic; thick-bedded; few argillaceous partings near middle of ledge.
	2	Limestone, micrograined, highly burrowed; fossiliferous (fenestrate bryozoans, brachiopods, and crinoids, including <i>Platycrinites penicillus</i>); thin-bedded with argillaceous partings.
	5.5	Limestone, micrograined to very fine-grained; scattered bioclastic grains; algal oncolites in interval from 2 ft below top to 1 ft above base of ledge; fossiliferous (brachiopods) in basal foot; thick-bedded.
	3	Limestone, micrograined to coarser-grained bioclastic; very fossiliferous (crinoids, including <i>Platycrinites penicillus</i> , bryozoans, including fenestrate forms, and brachiopods); scattered pyrite; thin to medium irregular beds with argillaceous partings.
	2	Rosiclare Sandstone Member of Ste. Genevieve Limestone Sandstone, greenish gray, fine-grained; intraclasts in upper foot and at base; few fossil fragments (in part silicified) and crinoid plates; one bed.

Appendix 7: Measured section at Rogers Group Princeton Quarry, Caldwell County. Garland R. Dever Jr. and Jack R. Moody, 1979.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
	9	Fredonia Limestone Member of Ste. Genevieve Limestone Limestone, micrograined to very fine-grained; in part coarser-grained bioclastic; fossiliferous (brachiopods, fenestrate bryozoans, and crinoids); few thin stringers of chert; thin- to medium-bedded with argillaceous partings.
	24.5	Limestone, bioclastic (mainly micrite-enveloped grains); fossiliferous (abundant colonies of coral, <i>Schoenophyllum aggregatum</i> , in interval 14 to 15 ft below top of ledge); coral colonies occur on irregular surface of low mounds and associated with varied thicknesses (1 ft or more) of argillaceous limestone, greenish gray shale, and yellowish orange-weathering dolomite.
	2	Shale with interbedded limestone; shale apparently pinches out laterally.
	6.5	Limestone.
		Top of prominent zone of thin-bedded limestone and shale. Base of interval measured in quarry face, Oct. 19, 1979.

Appendix 8: Measured section at Bluegrass Materials Hartford Quarry, Ohio County. Garland R. Dever Jr., 1980.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
		Top of measured and described section.
		Beaver Bend and Paoli Limestones Limestone, micrograined to microcrystalline; abundant fossil fragments on weathered surface; in part greenish gray, argillaceous; in part slightly dolomitic; unit not measured.
	0.5	Shale; thickness ranges from 0.5 to 1 ft.
	3	Limestone: micrograined limestone in upper foot; oolitic and bioclastic limestone in middle foot; peloidal limestone in basal foot.
	1	Peloidal limestone and greenish gray shale; abundant intraclasts from underlying brecciated micrograined limestone.
	2	Ste. Genevieve Limestone Limestone, dark colored, micrograined, brecciated; scattered stringers of micrograined calcrite.
	13.5	Limestone: dominantly micrograined limestone in middle and upper parts of ledge, with stringers of calcarenitic (fine- to coarse-grained) limestone; calcarenitic limestone in lower 3 to 5 ft, with lenses of micrograined limestone.
	3	Limestone, peloidal, slightly argillaceous; dark colored, grain- and granule-size intraclasts; very thin shale near middle.
	9.5	Limestone: micrograined to microcrystalline limestone in upper part, with pockets of calcarenitic limestone; dolomitic limestone in lower part.
	4	Limestone: dominantly micrograined limestone in upper 1.5 ft; oolitic and bioclastic limestone, with lenses of micrograined limestone and stringers of micrograined calcrite, in lower 2.5 ft; fossiliferous (fragments of colonial coral, <i>Schoenophyllum aggregatum</i>) locally in basal part of ledge.
	1.5	Limestone, dominantly micrograined with disturbed appearance; calcarenitic limestone in basal 1 to 3 in.; fossiliferous (colonial coral, <i>Schoenophyllum aggregatum</i>).
	7	Dolomite, very finely crystalline; 1- to 2-in. shale at top; wavy contact with overlying ledge.

Appendix 8: Measured section at Bluegrass Materials Hartford Quarry, Ohio County. Garland R. Dever Jr., 1980.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
	12.5	Limestone, oolitic and bioclastic.
	4.5	Dolomite; lenses of bioclastic limestone.
	1.5	Limestone, coarsely crystalline, bioclastic.
	12.5	Limestone, mainly oolitic; more indurated than underlying ledge; indistinct bedding.
	15	Limestone, light-colored, oolitic, soft; very finely crystalline at base; massive.
	4.5	Shale, greenish gray, calcareous; thin beds of very fine-grained limestone, mainly in middle part; distinctive unit in quarry face.
	2.5	Limestone, micrograined to very fine-grained; bands of very finely crystalline dolomite; one bed.
	3	Limestone, calcarenitic, with distinctive burrowing; in part argillaceous; thin-bedded with thin shales.
	20	Limestone, mainly dark-colored; in part light-colored beds; fine- to medium-grained, oolitic and bioclastic; medium-bedded to indistinctly bedded; this ledge and immediately underlying 3-ft and 8-ft ledges form distinctive banded zone in quarry face.
	3	Limestone, light-colored, bioclastic.
	8	Limestone, dark-colored, very finely crystalline; lenses of bioclastic limestone with very finely crystalline matrix; medium-bedded.
	18	Limestone, light-colored, oolitic; lenses of coarser-grained bioclastic limestone; scattered beds of very finely crystalline dolomite.
	3	Dolomite, brownish colored, very finely crystalline; scattered bioclastic grains; prominent occurrences of pink crystalline dolomite in vugs and nodules.
	5	Limestone, light-colored, oolitic; lenses of coarser-grained bioclastic limestone; lenses of very finely crystalline dolomite.
	20	Upper part of ledge inaccessible; laterally in quarry dominantly oolitic limestone, with lenses of dolomite, in upper 14 to 18 ft of ledge; very finely crystalline dolomite in lower 8 ft; prominent bedding plane at top of ledge.
	10	Limestone, micrograined and microcrystalline.
	2	Limestone, calcarenitic; thin shale at base.
	4	Limestone, very finely crystalline to bioclastic; very finely crystalline lithology may be recrystallized bioclastic limestone; medium to indistinct bedding; thin shale at base.
	6	Limestone, very finely crystalline; small nodules composed of crystalline calcite and dolomite; medium-bedded.
	10.5	Limestone, calcarenitic; locally very finely crystalline; massive.
	7.5	Limestone, micrograined to very fine-grained; scattered small nodules of gray and bluish gray chert in upper 2.5 ft.
	12	Limestone, calcarenitic, with very finely crystalline matrix.
		Water level in quarry, July 16, 1980. About 50 ft of water reported overlying lowest quarry floor.

Appendix 9: Measured section of Stab roadcuts and outcrops, Pulaski County. Garland R. Dever Jr. and Lance S. Barron, 1984 and 1985.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
		Roadcuts along Ky. 80 from junction with Ky. 1675 westward 0.3 mi to Buck Creek bridge.
		Tygarts Creek Member of Slade Formation Limestone, fine- to medium-grained, oolitic, bioclastic (in part micrite-enveloped grains); fossiliferous (crinoids, including <i>Agassizocrinus</i> and <i>Talarocrinus</i> ; blastoid, <i>Pentremites</i> ; and gastropods).
	1	Cave Branch Bed of Slade Formation Shale, greenish gray.
		Mill Knob Member of Slade Formation Lateral variations in lithology and thickness of carbonate units common in upper half of Mill Knob Member.
	5	Dolomite, pale yellowish gray, microcrystalline to very finely crystalline; brecciated dolomite, locally up to 1.5 ft thick, at top; in part fine- to coarse-grained, bioclastic limestone and in part micrograined limestone.
	9	Limestone, light olive-gray, very fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains); thin stringers of micrograined calcrete; micrograined limestone in basal 2.5 ft and upper 4 in.
	1	Dolomite, medium olive-gray to light olive-gray, microcrystalline to very finely crystalline; one bed; argillaceous partings at top and base of ledge.
	1	Limestone, micrograined; locally brecciated; in part dolomitic.
	2	Dolomite, light gray, microcrystalline to very finely crystalline; dolomitic micrograined limestone in upper part.
	3	Limestone, light olive-gray, bioclastic (in part micrite-enveloped grains).
	12.5	Limestone, very light olive-gray, fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains), oolitic; in part with dolomitic matrix in upper 4 ft; thick- to thin-bedded.
	6	Dolomite, 2 to 5 ft thick, overlain by limestone, reciprocally 4 to 1 ft thick. Dolomite, light gray, microcrystalline to very finely crystalline; in part bioclastic grains in dolomitic matrix; intraclasts of micrograined limestone in basal 3 to 4 in.; stylolites; massive. Limestone, fine- to coarse-grained, bioclastic (in part micrite-enveloped grains), oolitic; thin-bedded.
	4	Limestone, light olive-gray, micrograined; yellowish brown, rubbly, micrograined limestone in upper 2 to 4 in.; stringers of micrograined calcrete (in part silicified) in upper 1.5 ft; thin to medium irregular beds; greenish gray shale, 2 to 4 in. thick, at top.
	13.5	Limestone, very light olive-gray, fine- to very coarse-grained, bioclastic (in part micrite-enveloped grains), oolitic; fossiliferous (crinoids); thick-bedded to massive.
	5	Covered interval.
	2.75	Limestone, medium olive-gray to light olive-gray, very fine- to coarse-grained, bioclastic (in part micrite-enveloped grains).
	1.5	Covered interval.
	3	Limestone, light olive-gray, fine- to coarse-grained, bioclastic (mainly micrite-enveloped grains), oolitic; fossiliferous.
	13.5	Covered interval.
	4	Warix Run Member of Slade Formation Limestone, light olive-gray to medium olive-gray, fine- to very coarse-grained in finer-grained matrix, peloidal, bioclastic (in part micrite-enveloped grains), oolitic, intraclastic (limestone and calcrete); quartz silt and very fine-grained sand; finely laminated; thin-bedded.

Appendix 9: Measured section of Stab roadcuts and outcrops, Pulaski County. Garland R. Dever Jr. and Lance S. Barron, 1984 and 1985.		
<i>Description</i>		
<i>Ledge Number</i>	<i>Thickness (ft)</i>	<i>Lithology</i>
	17.75	Ste. Genevieve Member of Slade Formation Limestone, light olive-gray, very fine- to coarse-grained, bioclastic (commonly micrite-enveloped grains), oolitic; micrograined limestone and stringers of micrograined calcrete at top; commonly finely laminated; massive; medium- to thin-bedded at top and base.
	1.5	Covered slope.
		Outcrops on east side of Buck Creek beneath Ky. 80 bridge.
	3	Limestone, medium olive-gray to light olive-gray, micrograined; thin irregular zones of very fine- to coarse-grained limestone; fossiliferous (corallites, in part silicified, of <i>Schoenophyllum aggregatum</i> at 20 in. above base); indistinct bedding.
	4.25	Limestone, light olive-gray, fine- to coarse-grained, bioclastic; fossiliferous (crinoids and brachiopods); few small bodies of chert; thin- to medium-bedded.
	13.5	Limestone, light olive-gray, micrograined; scattered bioclastic grains; sparsely fossiliferous (brachiopods); discontinuous, irregular lenses of fine- to coarse-grained, bioclastic limestone in lower 7.5 ft; burrows filled with granular limestone of overlying ledge extend downward into this ledge; few irregular bodies of chert in upper part; thin- to medium-bedded; in part nodular-bedded.
	0.25	Chert conglomerate: intraclasts of black chert, limestone, and fossil fragments (bryozoans, brachiopods, and acrocyathid corallites) in granular limestone matrix.
	1	Burnside Member of Slade Formation Limestone, medium olive-gray, very fine- to coarse-grained, bioclastic; fossiliferous (colonial corals: colony of <i>Syringopora</i> and corallites of <i>Acrocyathus proliferous</i>); discontinuous bed of chert (up to 4 in. thick) at top.
		Limestone, micrograined; abundant bioclastic grains; fossiliferous (silicified colonies of <i>A. proliferus</i>); irregular bodies of black chert; top of ledge at water level of Buck Creek on Nov. 29, 1984.