

THE OCCURRENCE OF REGISPONGIA CONTORTA (KING) IN CHESTERIAN (UPPER MISSISSIPPIAN) ROCKS OF SOUTHERN ILLINOIS AND WESTERN KENTUCKY

George H. Fraunfelner
Department of Geology
Southern Illinois University
Carbondale, IL 62901

ABSTRACT

Specimens of calcareous sponges collected from Glen Dean, Menard, and Clore limestones (Chesterian) of southern Illinois and western Kentucky were identified as *Regispongia contorta* (King). These specimens represent the first reported occurrence of this genus and species in the Illinois Basin. They lived in a low energy, shallow marine shelf environment on a muddy bottom.

INTRODUCTION

Specimens of calcareous sponges were collected from the Glen Dean Limestone just upstream from the boat ramp, along the south side of the Ohio River, at Carrsville, Livingston County, Kentucky; from the Menard Limestone in the railroad cut just north of the railroad tunnel near Flatwoods, Johnson County, Illinois; and from a limestone in the Clore Formation in a draw about one mile northeast of Saratoga, Union County, Illinois (Center line NE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 31, T. 11S., R.1 E.) in southern Illinois and western Kentucky. These specimens were identified as *Regispongia contorta* (King) based on their wall structure, wall thickness, shapes and size. They represent the first recorded occurrence of the genus and species in the Illinois Basin (Figures 1 and 2).

MATERIALS

The materials studied consist of seven complete or nearly complete and several fragmentary, calcareous sponge specimens (Figures 3-11).

PREVIOUS WORK

Sponges have previously been reported from rocks of Chesterian age in the Illinois Basin; however, a record of their identification and location has not been published. *R. contorta* was named *Wewokella contorta* by King (1943). Rigby (1978) recognized that *W. contorta*, while resembling *Wewokella solida* Girty, the type species for *Wewokella*, actually had a skeletal structure composed of polyactine spicules rather than the Y-shaped triactine spicules found in *W. solida*. On that basis Rigby established the genus *Regispongia* to include the species *contorta*. *R. contorta* has previously been reported from the "Jacksboro" limestone, Pennsylvanian of Texas by King (1943); from the Mississippian/Pennsylvanian Manning Canyon Shale of Utah by Rigby and Moyle (1959); from the Magdalena Formation, Lower Pennsylvanian of Texas by Nelson (1960); from the Gunsight Limestone Member of the Graham Formation, Pennsylvanian of Texas by Croneis and Toomey (1965); from the Vanport and Putnam Hill Limestones and the Mercer marine unit, Pennsylvanian of Ohio by Hoare and Sturgeon (1968); and from the Jensen Member of the Chainman Formation, Upper Mississippian/Lower Pennsylvanian of Utah by Rigby (1978). The present known range of the genus *Regispongia* is Late Mississippian (Chesterian) in Utah to Early Permian? (Wolfcampian) in Texas (Rigby, 1978).

TEXT

The specimens of *Regispongia contorta* studied range from elongate conical and sinuous to short cylindrical and contorted. The largest elongate conical specimen measures 117 mm. in length by 18 mm. in width (maximum) (Figure 3), while the largest cylindrical contorted specimen measures 44 mm. in length by 17.5 mm. in width (maximum) (Figure 8). Both shapes are characteristic of the species and occur together (Figures 3 and 4). These sponges have thick walls and long, narrow central cavities (Figures 7 and 8). The specimens are well-preserved, but do bear heavy secondary calcification, which obscures some of the spicular structure. However, characteristic polyactine spicules are visible in some areas of the specimens studied (Figure 5). The specimens are found distributed on bedding planes singly or in clumps (Figure 9). They are aligned parallel to the bedding planes or sediment layers with one exception (Figure 6), but they are not oriented in any specific direction (Figure 9). Two specimens are distorted, especially one from Carrsville (Figure 11), because of compaction. *R. contorta* occurs in argillaceous micritic (Menard) or crinoidal biomicritic limestones (Glen Dean and Clore).

R. contorta was found in association with complete, articulated specimens of the brachiopod *Composita subquadrata* (Hall), "cup" plates of the crinoid *Agassizocrinus*, crinoid columnals, and fragments of fenestrate and ramose bryozoan colonies (Figures 10 and 11).

DISCUSSION

The occurrence of both elongate conical and cylindrical contorted specimens together, along with the fact that both bear polyactine spicules, suggests that shape is not a good criterion for speciation as was implied by some early workers (Croneis and Toomey, 1965). The well-preserved condition of the sponges and of *C. subquadrata* suggests that these specimens were not transported for any great distance, if at all. The randomly clumped, unoriented distribution as well as the fine preservation of these specimens also suggests that they were not subjected to strong current activity. The occurrence of *R. contorta* specimens in argillaceous micritic and crinoidal biomicritic limestones is indicative of muddy bottom conditions, because the specimens were not transported for any distance, if at all. And, the occurrence of *R. contorta* with *C. subquadrata*, a shallow marine shelf organism (Bretsky, 1968), indicates that *R. contorta* lived in a shallow marine shelf environment in the southern Illinois region. Low energy conditions also prevailed as indicated by fine preservation of fossils, little or no fossil transport, and lack of orientation of fossils on bedding planes.

CONCLUSIONS

Their polyactine spicules, thick walls, characteristic shapes, and size identify the calcareous sponges studied as *Regispongia contorta* (King).

These specimens represent the first recorded occurrence of the genus and species in the Illinois Basin.

Regispongia contorta lived in a low energy shallow marine shelf environment on a muddy bottom.

LITERATURE CITED

- Bretsky, P.W., 1968, Evolution of Paleozoic Marine Invertebrate Communities, Science Vol. 159, p. 231-233, 1 text-fig.
- Croneis, C. and D.F. Toomey, 1965, Gunsight (Virgilian) Wewokellid Sponges and Their Depositional Environment, Jour. Paleo. Vol. 39, p. 1-17, pls. 5-7.
- Hoare, R.D. and M.T. Sturgeon, 1968, The Genus *Wewokella* (Proifera) in the Pennsylvanian of Ohio, Jour. Paleo. Vol. 42, p. 81-83, pl. 20.
- King, R.H., 1943, New Carboniferous and Permian Sponges, State Geol. Surv. of Kansas Bull. 47, p. 27-28, pl. 2, figs. 1, 8 and pl. 3, fig 5.
- Nelson, L.A., 1960, The Pennsylvanian Rocks of the Franklin Mountains East of Vinton, Texas, Roswell Geol. Soc. Guidebook Northern Franklin Mountains, southern San Andres Mountain, p. 131-134.
- Rigby, J.K., 1978, Two Wewokellid Calcareous Sponges in North America, Jour. Paleo. Vol. 52, p. 705-716, 1 pl., 3 text-figs.
- Rigby, J.K., and R.W. Moyle, 1959, Some Mississippian and Pennsylvanian Sponges from Utah, Jour. Paleo. Vol. 33, p. 399-403, pl. 56, text-fig. 1.
- Swann, D.H., 1963, Classification of Genevievean and Chesterian (Late Mississippian) Rocks of Illinois, Illinois State Geol. Surv. R.I. 216, p. 8.

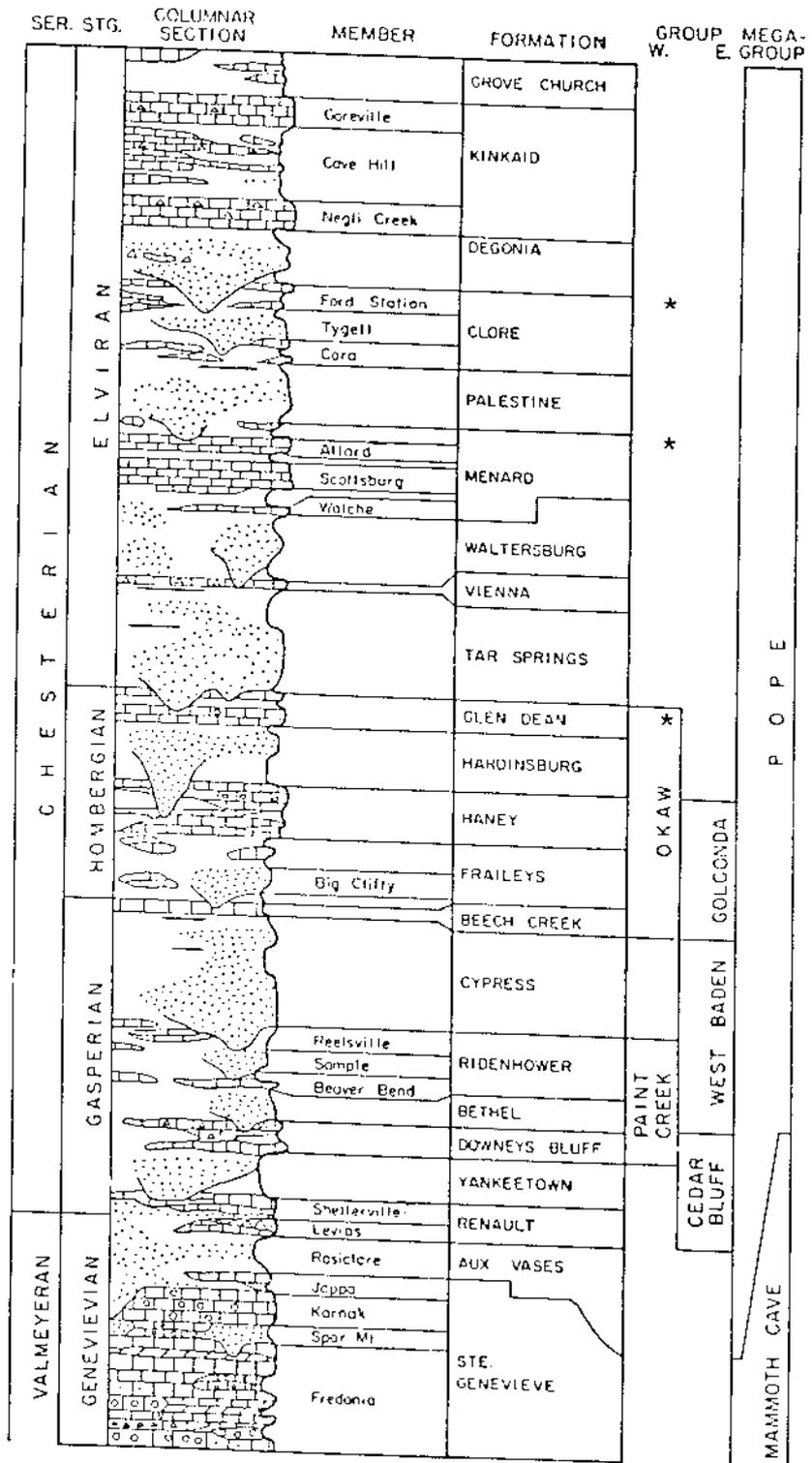


Figure 1. Columnar Section showing collecting levels (*). Swann, 1963

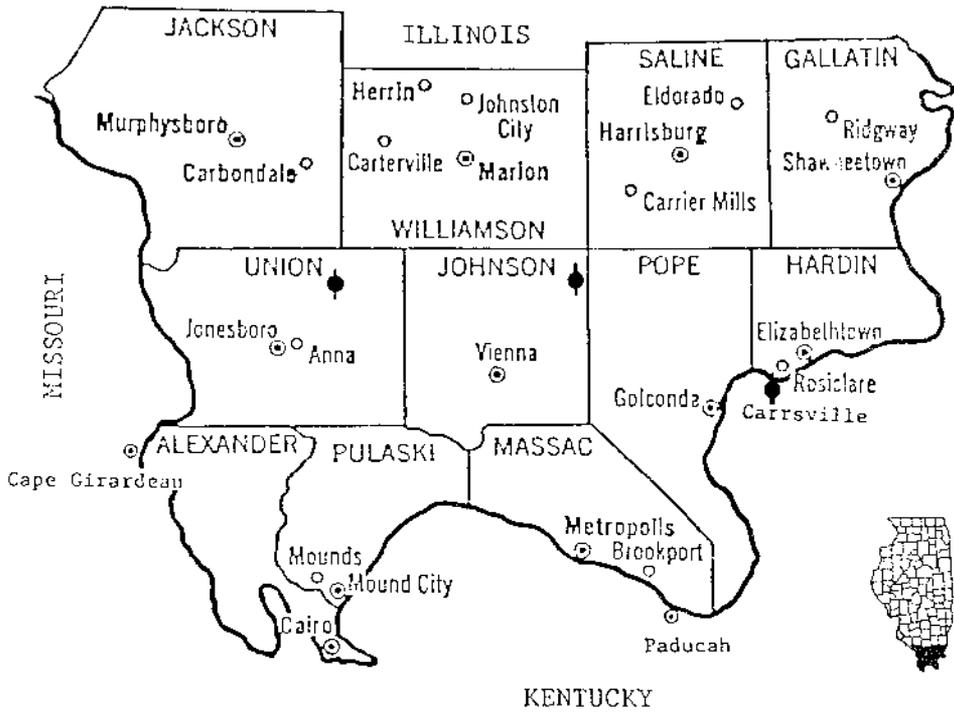
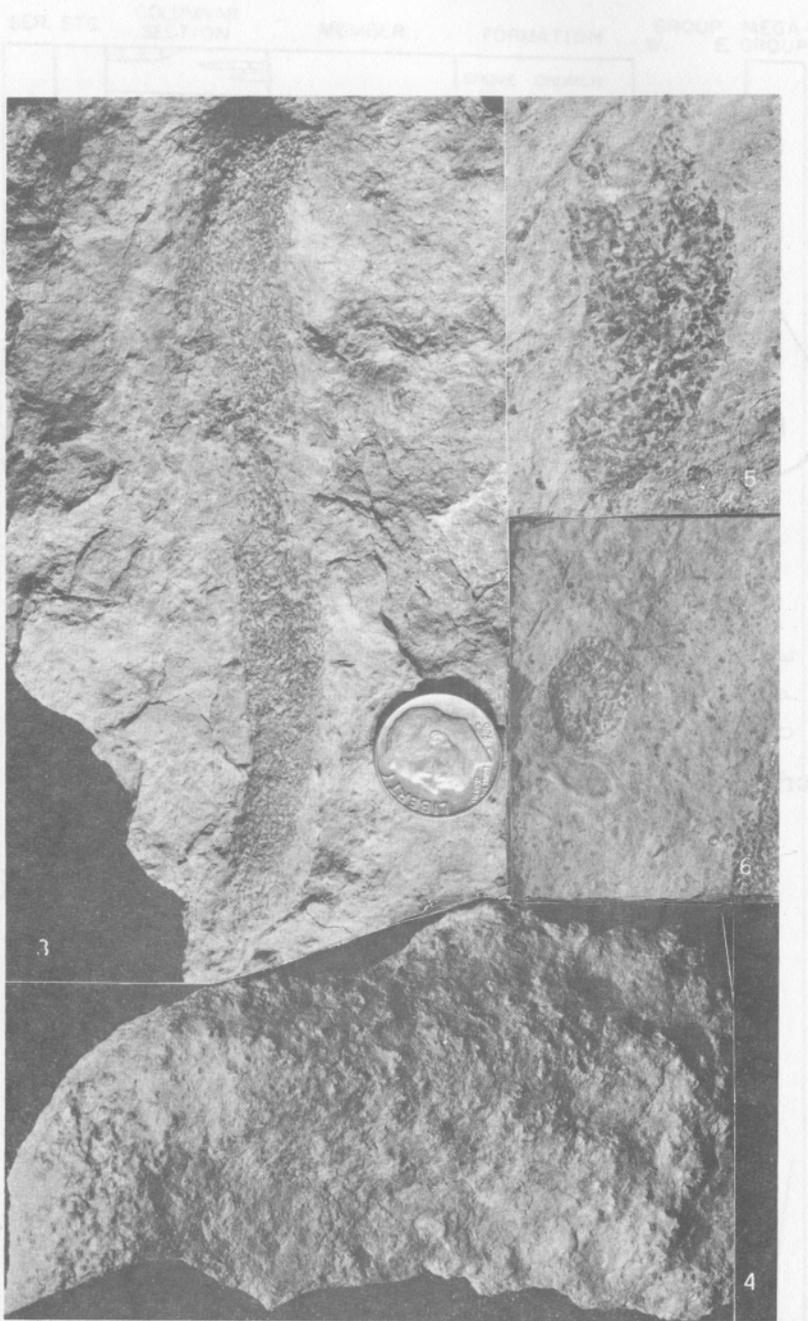
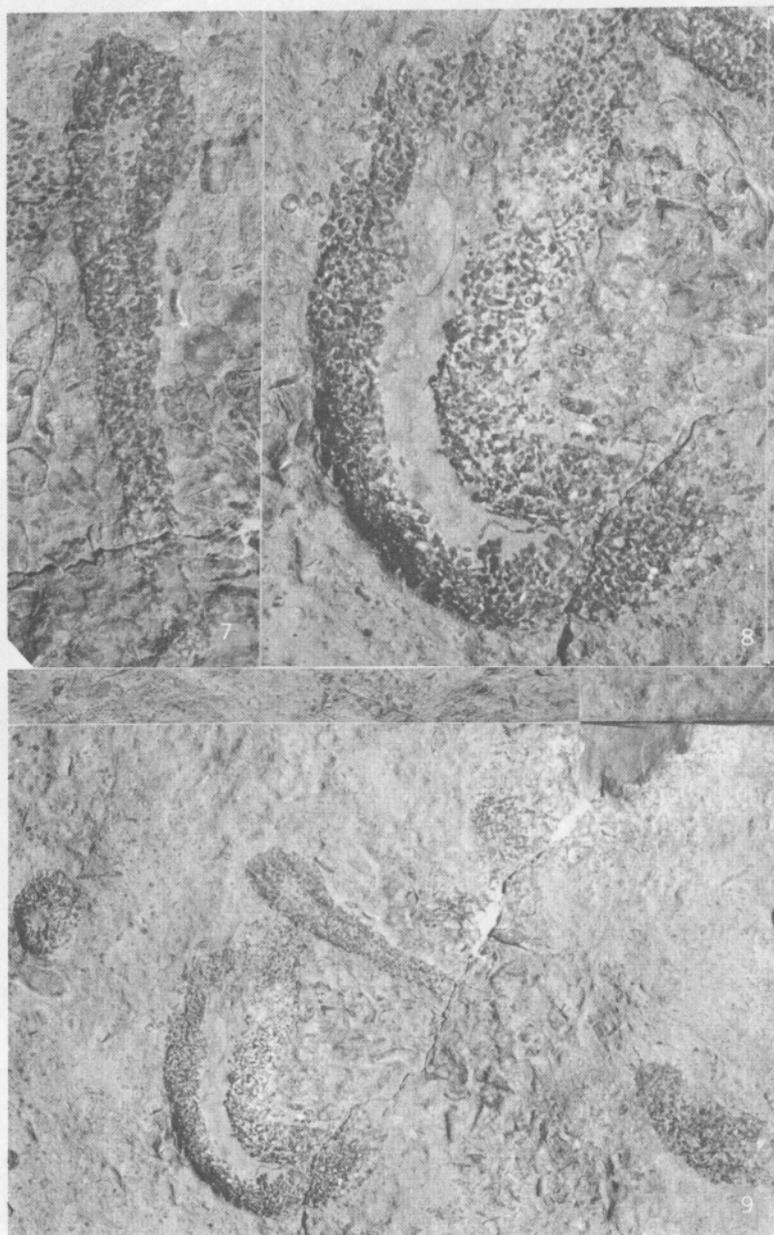


Figure 2. Locality Map showing collecting sites (†).



- Figure 3. *Regispongia contorta*, lateral view of elongate conical form from the Menard X1, S.I.U.M. 5184.
- Figure 4. *Regispongia contorta*, lateral view of cylindrical contorted form from the Menard X2, S.I.U.M. 5185
- Figure 5. *Regispongia contorta*, lateral view showing polyactine spicule in upper center of specimen from Clore X2, S.I.U.M. 4674.
- Figure 6. *Regispongia contorta*, top view of nearly vertically oriented specimen from Clore X1.5, S.I.U.M. 4674.



- Figure 7. *Regispongia contorta*, lateral view of weathered and eroded specimen from Clore showing thick walls and long, narrow central cavity. Specimen slightly compressed, laterally. S.I.U.M. 4674 X2. Note also the elongate conical form.
- Figure 8. *Regispongia contorta*, lateral view of weathered and eroded cylindrical contorted specimen from Clore showing thick walls and long, narrow central cavity. S.I.U.M. 4674 X2.
- Figure 9. *Regispongia contorta*, top view showing alignment of specimens (Figures 5-8 above) parallel to bedding plane except for specimen on the left, lack of directional orientation, and clumped distribution of specimens from Clore. S.I.U.M. 4674 X2. Note also occurrence of conical and contorted forms side by side.

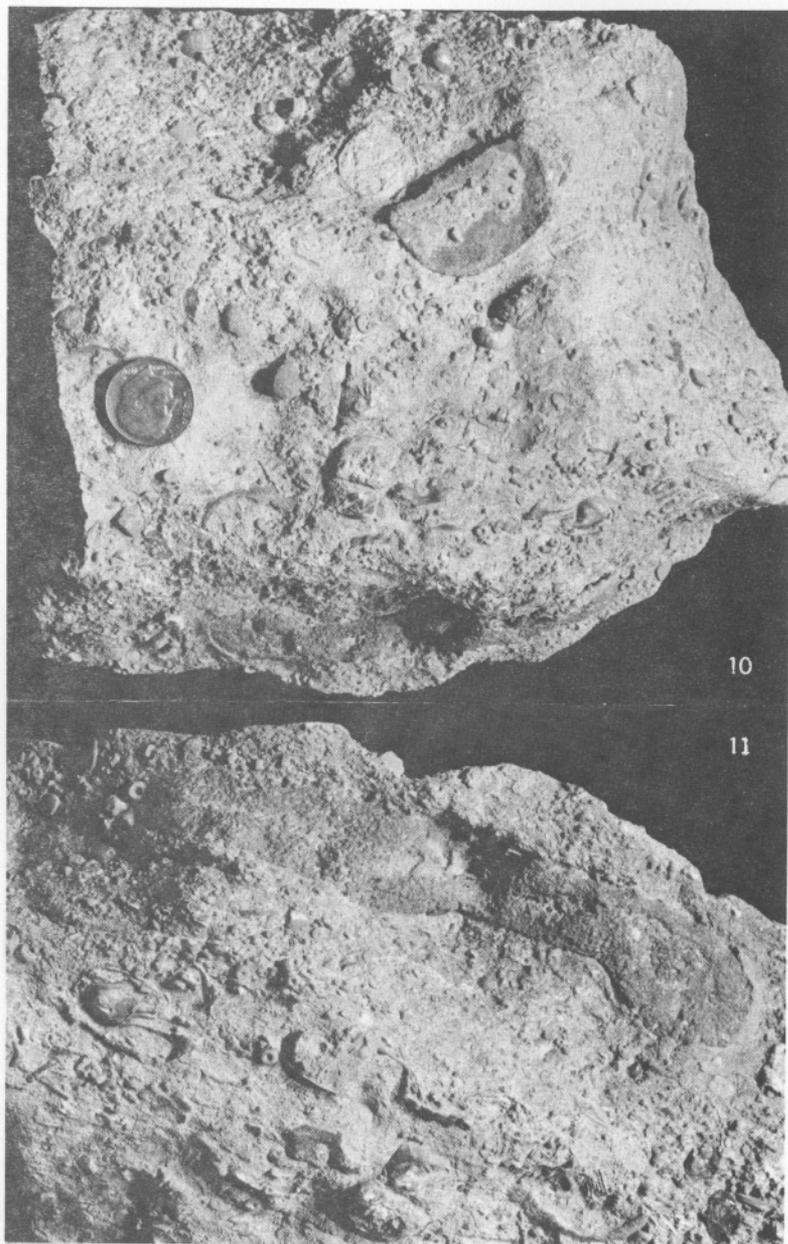


Figure 10. Top view of small slab showing much compressed *Regispongia contorta* specimen from Glen Dean parallel to and near lower margin X2/3. Note associated fauna: *Composita subquadrata* in lower center, *Agassizocrinus* plates in center and upper left, crinoid columnals, fenestrate bryozoan fragments in upper right, and ramose bryozoan fragments in lower left. S.I.U.M. 5485.

Figure 11. *Regispongia contorta*, lateral view of compressed, eroded and weathered specimen (enlargement of Figure 10) from Glen Dean XI.25. Note alignment parallel to sediment layers, *C. subquadrata* left center, crinoid columnals upper left, and fenestrate fragment lower right. S.I.U.M. 5485.

*S.I.U.M. refers to the Southern Illinois University Museum.