CENTRAL IOWA MINERAL SOCIETY

NEWS NUGGETS

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Stainbrook Geologic Preserve
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University of Iowa

General

The Stainbrook State Geologic Preserve is centered on a roadcut just east of the Mehaffey Bridge across the Coralville Reservoir, and on the area uphill from the roadcut to the southeast.

To reach this area, drive northeast out of North Liberty on County Road F28, cross the Mehaffey Bridge over the Coralville Reservoir, and then park on the road shoulder near the intersection of F28 and Sugar Bottom Road. Alternately, drive west out of Solon on F28 and pull onto the road shoulder just after the road emerges from the roadcut as you approach the bridge.

Be particularly careful when crossing F28! Traffic here frequently violates the speed limit! In addition, beware that the vegetation at the base of the roadcut usually includes both wild parsnip and poison ivy, both of which are hazardous to the touch. Finally, beware of loose rocks; the sides of the roadcut are not good places to practice rock climbing!

What to Look For

The exposed rocks in the roadcut include many fossils, and on top of the cut, on the south side of the road, there is an exposed block of rock that has glacial scratch marks on it.

The rock exposed here is all Devonian limestone from the Cedar Valley group; this group of limestone layers was deposited in a shallow sea, and the deposition of each layer ended with the exposure and erosion of the surface of the deposit. The uppermost layers exposed at Mehaffey bridge are State Quarry limestone, a system of limestone deposits that formed in deeply eroded tidal channels. Below this erosion surface is the Cou Falls limestone, part of the Coralville formation, and at the base of the roadcut, there is an exposure of the Rapid Member of the Cedar Valley Limestone formation.

The most abundant fossils in this area are crinoid stem fragments; these look like small washers such as you might find in a hardware store, and there are some layers exposed in the roadcut that are almost solidly made of these. Less commonly, you'll find assembled segments of crinoid stem. These look like thick strings of washer-like beads. The crinoid, or sea-lily, is an echinoderm, a relative of the starfish; the body of the animal floats in the water, anchored to the bottom by a long stem while it feeds on plankton using a frilly array of branched arms;

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Central Iowa Mineral Society

April General Meeting:

April 6, 2001

Executive Committee 6:45 PM
General Meeting and Program 7:30 PM
Drake University, Meredith Hall
South Lecture Room

Rockhounding Adventures

by Carol and Ray Brockman

Carol and Ray have been rockhounding and collecting in Colorado and Florida and will share their experiences with a presentation and slides. They will show some specimens collected and some Florida seashells.

Show and tell: Bring in your favorite crystal

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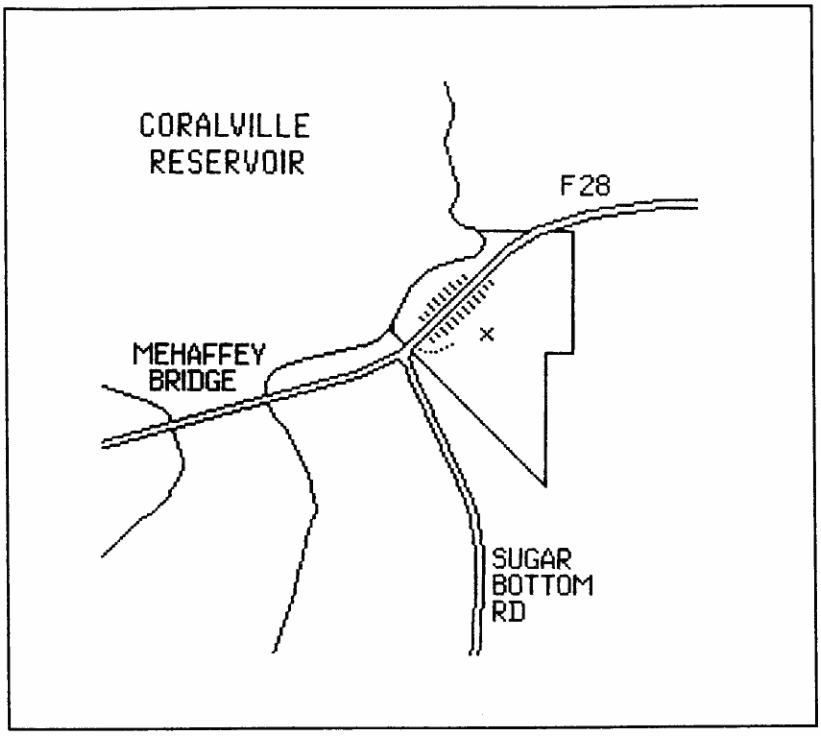
fossils of the crinoid body or of the complete animal are uncommon, but the hard segments of the stem are very common. (The Geology department and State Geological Survey maintain a nice display of complete crinoid fossils in the lobby of Trobridge Hall on the University of Iowa campus.)

Another common fossil in this roadcut is the brachiopod. These creatures resemble clams, but the body inside their shell was more like that of a barnacle, and they are considered to be in a phylum all to themselves. Merrill Stainbrook, after whom this preserve was named, laid the groundwork for our modern understanding of Devonian brachiopods. In the Devonian era, bracheopods were considerably more common than clams; to distinguish between the two, note that the left and right shells of a clam are usually mirror images but that each shell in isolation is always at least a bit asymmetrical. In contrast, each brachiopod shell is always symmetrical, but the two shells of each animal are usually quite different from each other.



Coral fossils are also fairly common, including the showy hexigonaria fossils with individual coral cells about a centimeter across, packed in a hexagonal array and built into hemispherical coral colonies that frequently grew to the size of soccer balls. Less showy colonial coral fossils are common, as well as the horn-shaped fossils of non-colonial coral animals.

Bryozoan fossils are also fairly common. These are the skeletons of colonies of animals that superficially resemble corals, but they are usually much smaller and many have open and interestingly structured shapes. Each species had a characteristic colonial organization; for example, some colonies resemble open lacework, some resemble drillbits or wood screws, and some were formed into plates or branching antler like structures.

More difficult to recognize fossils include sponges and fossil wormholes (some probably made by real worms, and others made by burrowing animals). Fossil trilobite skeletons are occasionally found, but they are uncommon here. Fish bones and shark teeth are also sometimes found.

To visit the exposed slab of rock with glacial scratch marks, climb to the top of the southeast side of the roadcut, following the dirt path that goes up a small gully from the corner of Sugar Bottom Road and F28. When the new Mehaffey Bridge was built, the fill needed for the east approach was excavated from this area. The excavated dirt consisted of glacial till capped with a 30 foot thick layer of windblown loess (dust).

During the excavation, a raised knob of Devonian limestone was uncovered. This knob was shaped by glacial action during a pre-Illinoisian ice age, over 500,000 years ago. The top surface of this stone is covered with easy to read scratch marks that clearly show the direction of the glacial flow. Note that the most recent ice age was only 10,000 years ago, when one lobe of glacial ice reached as far south of Des Moines, but that the ice during that era did not enter eastern Iowa.

Climbing the side slope above the glaciated limestone, it is interesting to note the transition from the coarsely sorted glacial till, made of mixed sand and gravel, to the fine crumbly loess that blankets the hilltop. Loess is windblown dust, frequently, the loess deposits are thickest on the downwind sides of river valleys that were once choked with glacial silt.

When to Visit

This area is best visited in cool weather; there is no shade, and the sunlight reflected from the rocks can get quite hot. It is worth noting that migratory waterfowl such as Pelicans are quite commonly seen over the Coralville Reservoir during some of the best times of year for visiting this area.

Threats to the Stainbrook Geologic Preserve

The biggest threat to this area comes from people intent on collecting fossils. Do not excavate rock specimens from the sides of the roadcut. This may contribute to instability and possible rockslides, and it deprives others of the opportunity to see the fossils in those rocks. If you want to collect fossils, do it outside the preserve and off federal land! It is illegal to take fossils from federal land without a permit.

Exposed cliff faces are subject to natural erosion; over a few thousand years, frost action, acid rain, and vegetation will reduce the exposed rock faces of the Stainbrook preserve to steep wooded slopes with a thin layer of rocky topsoil. You can already see this process starting on the scree surfaces at the foot of the slope, but it will be many decades before the most interesting of the exposed fossils succumb to this.

Vandalism has been an occasional problem on the exposed glacial scratch marks. This rock surface has, occasionally, been painted, and a few efforts have been made to add manmade scratches to the ancient glacial scratches.

Contacts

The Stainbrook Geologic Preserve is on property owned by the United States Army Corps of Engineers, and it is currently managed by the University of Iowa Division of Recreational Services, (319)335-9293. (From The Sierra Club Guide to Natural Areas in and around Iowa City http://www.cs.uiowa.edu/~jones/natural/stainbrook.html)

The Importance of Archaeoptryx

The lithographic limestones of Germany near the small town of Solnhofen in Bavaria , Germany have yielded fossils of exceptional quality. The fossils were preserved in particularly fine grained limestone formed in what seems to have been a calm, shallow ocean basin during the Jurassic. The first Archaeoptryx fossil was found in 1861 and the second in 1877. There are five fossil plates with specimens considered to be fossils of Archaeoptryx.

The 1861 plate was discovered at a time when science was looking for "intermediate fossils" that would demonstrate evolution. The fossil's combination of toothed jaw, long tail and other characteristics of reptiles along with feathers seemed to be just such a fossil. Whether it was a bird-like reptile or a reptile-like bird, it seemed that the animal could be construed to have evolved from a reptilian ancestor.

Archaeopteryx lithographica. Photo of the specimen held by the Museum for Natural History, Berlin.