Things To See at Hwy 21 Bridge Over the Brazos River

This locality is famous for being the most fossiliferous site in Texas. It has been called Moseley Ferry after the river crossing in the early days of Texas, and more recently called Whiskey Bridge because this was the closest place to A&M where Aggies could go to get a drink. The fossils were first described in 1848 by Roemer, a German geologist sent by the Berlin Academy of Sciences to see if Texas was a fit place for settlement (he said it was!).

Take the path straight ahead to see examples of how the sediments were deposited. The path to the right under the bridge goes to an excellent fossil collecting area.

The strata exposed here are Eocene in age, which means that they are 35 million years old. Some of the sediment is well cemented and forms hard ledges, an unusual material here in the Brazos River flood plain. These rocks gave name to the town just north of the river, Stone City. In return, the town gave the name Stone City Bluffs to the outcrop, and you see the stones everywhere. Most of the outcrop is soft sediment—sand, silt, and a peculiar dark green material called glauconite, our key to figuring out where these sediments were deposited. When you look at glauconite, you see that it is in little pellets. In the modern Gulf of Mexico, these pellets are produced by clams and gastropods as they clean mud off their gills and as fecal material by worms. When these pellets are buried several feet down, the clay is changed to glauconite, a zeolite (similar to what is in a water softener). Today this process is going on 50 miles offshore in water 200 to 600 feet deep.

Consider the sediments as you descend the hill (see the stratigraphic column on the reverse side).

At 20 meters, you are in the sand of the Wheelock Member. Since we cannot see any fossils or sedimentary structures, we will skip this unit.

At 17 meters is the Moseley Bed, a siderite cemented hard layer. Note that it is full of fossils, and if you look carefully, the rock is made up of other rocks cemented together. Apparently the sediment was being lithified at the mud/water interface, and then storms would rip up the bottom and further lithification would weld the mass into the layer you see. Look at the edge of the ledge and you can see some of the rip up clasts as nodules of different color and having a different internal shell layer orientation to the rest of the ledge. These rip up layers are unusually rich in shells because the smaller materials get washed out. The best evidence that hard grounds were exposed on the sea floor is that some of the clasts are encrusted by marine organisms that only grow on hard substrates.

Below the Moseley Bed are glauconite sands which contain 250+ species, including snails (gastropods), clams (pelecypods), corals, fish parts, and lots of other things. See your identification guide for some pictures. Burrowing organisms like shrimp frequently disrupt the bedding of the glauconite zones. The burrows are occasionally infilled by sediment and hard cement and can be dug out as a horizontally branching shape.

This sequence is repeated, starting at the hard ground at 13.5 meters.

At 11 meters is the top of a thick bed of silt and sand. These have laminations that occasionally change their tilt direction (geologists call this “cross-beds”). These are interpreted to have been deposited by tidal currents, just as we find modern sediments in the Gulf. These sediments are moved about as a sea bottom dune field (not in a desert!). When the water becomes still, clay settles over the surface forming what is called a “clay drape.”

For a really excellent paper see:

Yancey, T.E. 1995, Depositional Trends in Siliciclastic Deposits of the Stone City Transgressive Systems Tract, Middle Eocene, Texas: Gulf Coast Association of Geological Societies Transactions, v. XLV, p. 581-586.

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