

- 2.7' Mudstone, dark gray, highly mottled along an intricate network of veinlets or fractures that appear to be shrinkage cracks. Mottling is greenish gray in upper part of unit, yellow in lower part. Bedding and lamination are absent. A few small lenses of carbonate rock are present. This unit appears identical to Lawson Shale at Crown III. Both contacts are sharp.
 - 0.7-1.0' Limestone and shale; unit consists of flattened septarian concretions of carbonate rock surrounded by hard, dark gray shale. The upper contact is planar, lower contact sharp and undulating.
 - 2.6' "Anvil Rock" sandstone, light gray, weathers yellow, very fine grained, argillaceous, indistinct lamination and very thin bedding. Lower contact sharp.
 - 0.9' Anna Shale, grayish black, weathers with light bluish cast, common tan "phosphatic" nodules, the upper part is thinly laminated, the lower part nearly massive. Lower contact gradational.
 - 1.8' Energy Shale, medium to dark gray, darker upward, silty, pyritic, fine planar lamination in lower part. Sharp contact:
- Top of Herrin Coal.

Belt entry of Main North, at about Crosscut 80. This fall has been cleaned and re-bolted, but the upper strata are not accessible. The section is nearly identical to that at the previous site, except for changes in thickness of some of the units. All thicknesses were estimated:

Top of Fall - Base of limestone, a flat surface.

- 0.5' Mudstone, gray
 - 0.5' Limestone, brown
 - 2 ½' Mudstone, highly mottled dark gray and light greenish-gray.
 - 0.5' Limestone, concretionary.
 - 5-6' Sandstone, light gray, thinly bedded. Sharp contact.
 - 0.3' Anna Shale, lower contact gradational.
 - 4' Energy Shale, dark gray.
- Top of Herrin Coal.

Travelway of Main North, Crosscut 55. Roof fall above steel archway. Thicknesses were measured.

Top of Fall - Base of limestone, a flat surface.

- 3.0' Mudstone, highly mottled.
 - 0.6' Limestone, brown, concretionary.
 - 4.0' Sandstone, light gray, very fine, argillaceous, upper part medium bedded, lower part laminated. Sharp contact.
 - 1.0' Brereton Limestone, gray and brown mottled, micritic, nodular.
 - 1.4' Anna Shale, with "phosphatic" lenses at top.
 - 3.0' Energy Shale
- Top of Herrin Coal.

Travelway of Main North, Crosscut 39. Enormous roof fall extending an estimated 30 feet above top of coal. The roof above the arches is unsupported. All thicknesses are estimated, and lithologies in upper part of fall could not be sampled.

Top of Fall - arching out, has not reached a competent layer.

3-5' Gray, bedded rock. Probably siltstone or sandstone.

12-14' Dark gray rock, nearly black at top (but doesn't appear to include coal). The upper part has weakly developed layering, the rest lacks bedding. Most likely the rock is mudstone.

2-4' Bankston Fork Limestone, brown, a single bed.

2 ½' Mudstone, highly mottled.

2-2 ½' Sandstone, light gray

6' Shale, dark gray, indistinct bedding, probably all Energy Shale. A few limestone concretions at the top (could be erosional remnants of Brereton?)

Top of Coal.

Discussion. The highly mottled mudstone unit about 2 ½ feet thick, observed in all of the large roof falls, closely resembles the Lawson Shale that we observed in the Crown III Mine between the Brereton and Bankston Fork Limestones. The mottled mudstone at Crown II directly underlies the Bankston Fork, and in turn overlies a thin (less than 1-foot) unit of concretionary limestone. This limestone generally consists of flattened, ovoid, septarian concretions of carbonate rock surrounded by a medium to dark gray shale or mudstone. Below this concretionary limestone is the sandstone that we have always called Anvil Rock.

The chief difference between the roof successions at Crown II and Crown III is that at the latter mine, the sandstone is absent.

At least three correlations are possible (see **Figure 3**).

- A.) Anvil Rock Sandstone at Crown II grades southward to mottled Lawson Shale at Crown III. The concretionary limestone seen in Crown II is a local unit that does not occur in Crown III.
- B.) The sandstone in Crown II grades southward to mottled shale in Crown III. The concretionary limestone becomes part of the Bankston Fork Limestone; the mottled shale above it wedges out.
- C.) The sandstone at Crown II pinches out to the south, and the mottled mudstone is continuous between the two mines. As the sandstone pinches out, the concretionary limestone above merges with the top of the Brereton.

My Preferred Hypothesis is correlation C (above). The sandstone that has been called Anvil Rock at Crown II may actually be equivalent to the Jamestown Coal, which is older than true Anvil Rock Sandstone. The concretionary limestone that overlies the sandstone may be the Conant Limestone. Years ago, we observed and mapped Jamestown Coal and Conant Limestone in the Hillsboro Mine in Montgomery County,

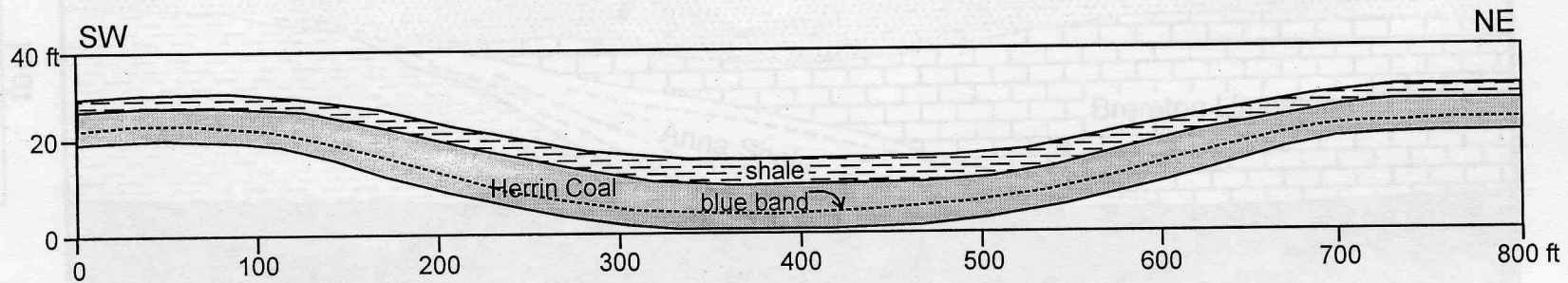
about 30 miles southeast of Crown II. The Conant at Hillsboro was a dark gray, very shaly limestone that commonly contained large, flattened oval septarian dolomite concretions. The concretionary limestone at Crown II closely resembles the Conant Limestone at Hillsboro. A photograph of the Conant Limestone at Hillsboro is on page 18 of ISGS Circular 540, the report on the Hornsby area of low-sulfur coal.

Testing the correlation between Crown II and Crown III will require careful examination of cores and in-mine exposures.

Figure 1. Generalized cross section of "Coal Valley"



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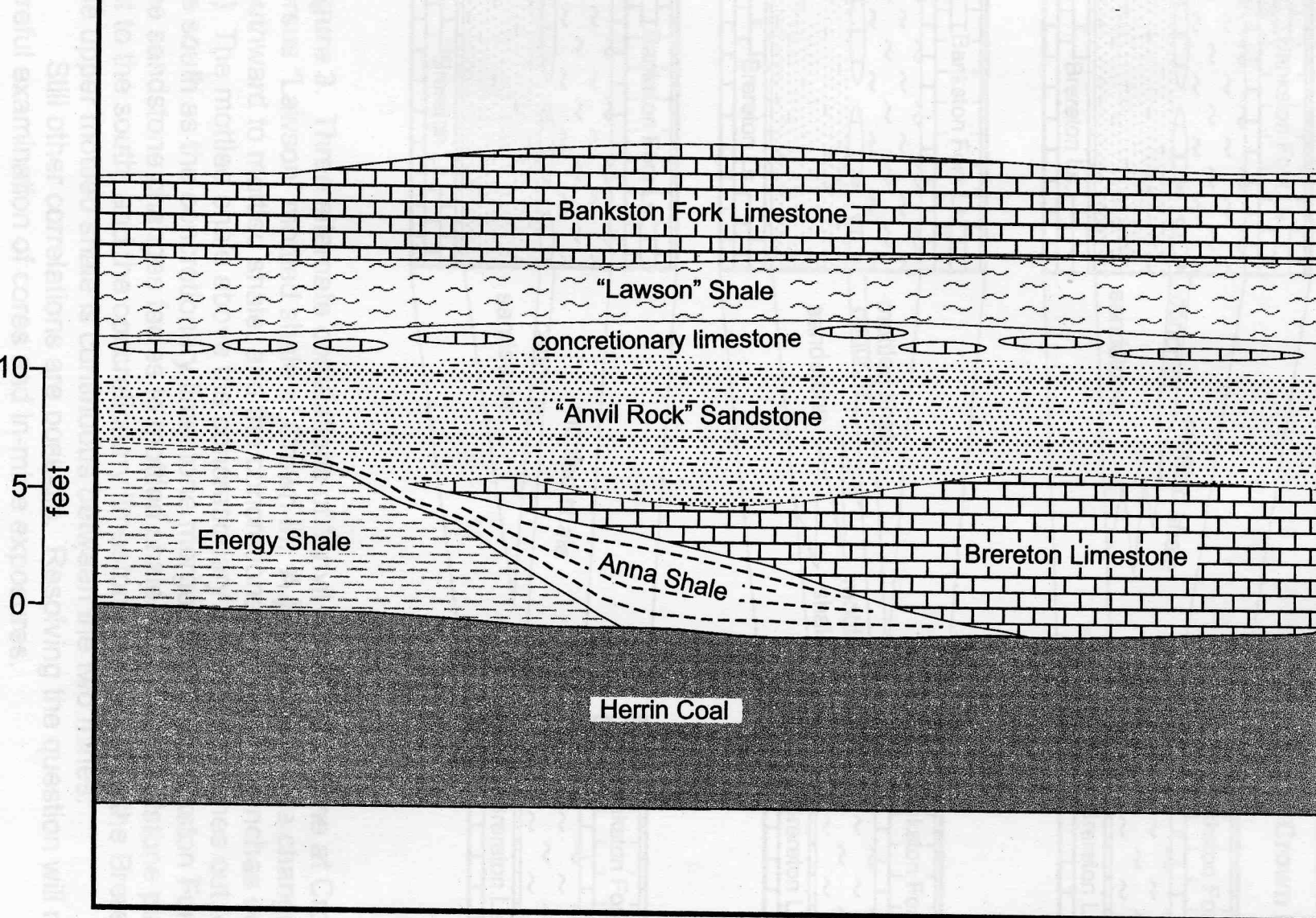


Figure 2. Generalized diagram of strata in northeastern part of Crown II Mine, as seen on visit of June 4, 2003.

Crown II

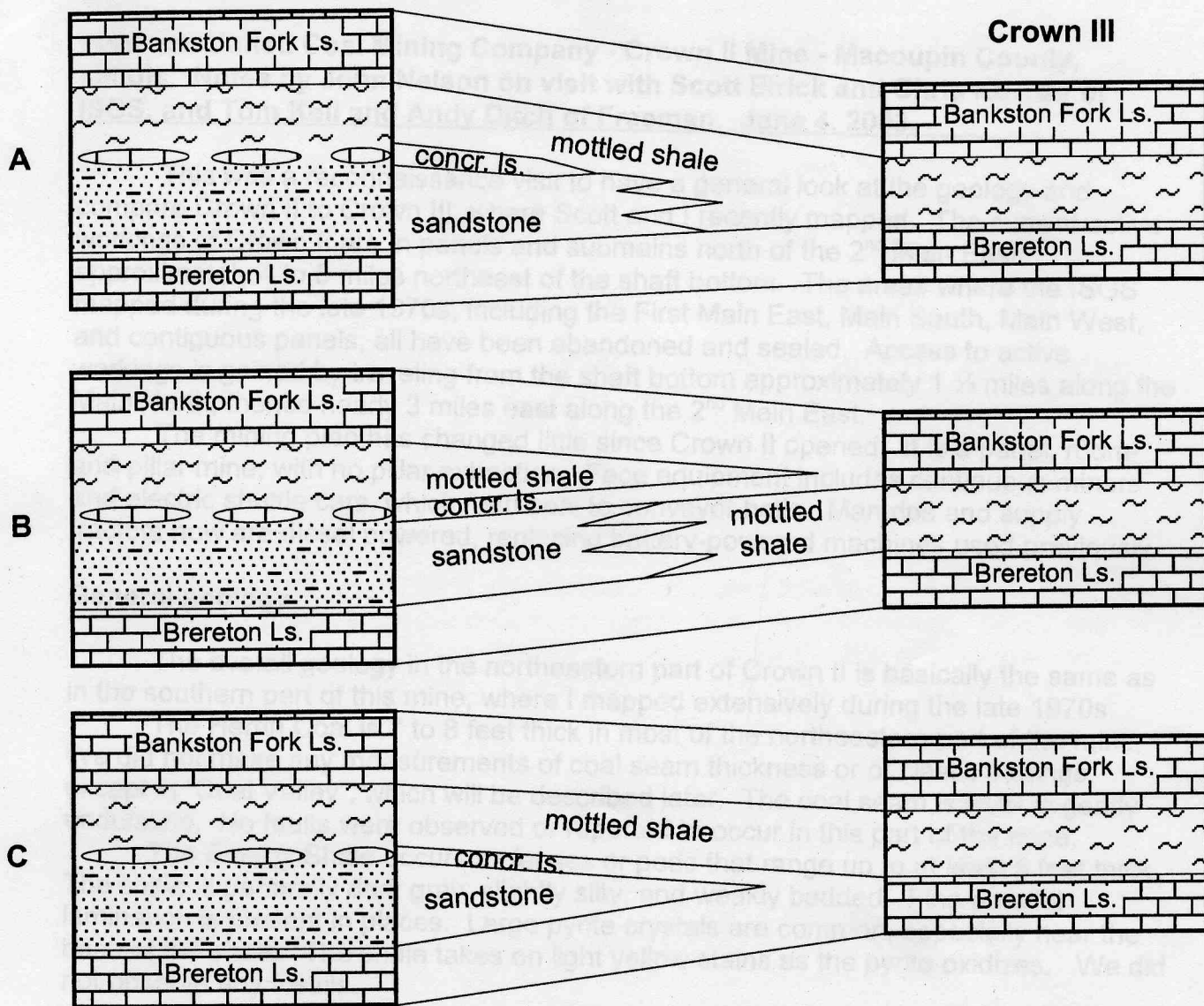


Figure 3. Three alternate correlations of “Anvil Rock” sandstone at Crown II versus “Lawson” mottled shale at Crown III. **A.)** The sandstone changes facies southward to mottled shale, and the concretionary limestone pinches out. **B.)** The mottled shale above the concretionary limestone pinches out to the south as the concretionary limestone merges with the Bankston Fork. The sandstone changes facies to mottled shale. **C.)** The sandstone pinches out to the south, and the concretionary limestone merges with the Brereton. The upper mottled shale is continuous between the two mines.

Still other correlations are possible. Resolving the question will require careful examination of cores and in-mine exposures.