

GEOLOGY AND MINING

Coal bearing strata in the project area are referable primarily to the Allegheny Group of Pennsylvania age. These rocks occur as dissected remnants overlying the ridge-forming Pottsville sandstone on the relatively flat mountain tops of a strongly dissected plateau. The coals are found in the Blossburg syncline which traverses the project northeastward from Pine Creek to the divide at Arnot. The divide separates the Babb Creek Watershed from the Tioga River Watershed to the east.

In the vicinity of Arnot, the valley floor is formed by a local unconsolidated glacial valley moraine reported as much as 80 feet thick. The glacial fill is comprised of well-graded material from clay to rounded cobbles with occasional boulders. Gravel pits are common in the area. Thin glacial terraces are present at higher elevations. In many places the glacial material is mantled with colluvial overburden on the hillside. Indications of glacial influence are found throughout the area. Some upland swampy areas contain deposits of fine impervious glacial clays which seal local flats or basin-like depressions over the more porous bedrock.

Six coals are present, four of which were mined in the project area. Table I and Figure I lists the coals in stratigraphic order and gives their positions relative to the Bloss coal, the major seam mined in the area. Although most of the coals are referable to Allegheny strata, it is possible that the lowest coal, the Bear Creek, may be correlated with the Mercer coal of the Pottsville Group. Precise correlations between the coals of Tioga County and the standard named coals of western Pennsylvania have not been made.

TABLE I  
COAL BEDS PRESENT IN THE  
BABB CREEK WATERSHED

<u>Coal</u>	<u>Other Designation</u>	<u>Interval</u>	
		<u>Average</u>	<u>Range</u>
Rock Vein	("E")	+170	150-180
Seymour	("E", "D")	+120	110-160
Morgan	(Monkey Vein C')	+80	70-100 indicated
Cushing	(Morgan, C)	+40	20-60
Bloss	(Lower Kittanning (?), "B") (Bear Creek-lower split only)	0	0
Bear Creek		-30	20-45

The geologic column, Figure I, does include an attempt to relate these coals to the standard section of western Pennsylvania. Most coals are poorly understood throughout the district and numerous inconsistencies in detailed stratigraphy and nomenclature exist.

The Bear Creek coal, though prospected in a few places, has not been mined.

The Bloss coal ("B") is the principal mined coal of the area. It is a widespread double-bedded coal aggregating 5 to 8 feet or more in thickness. The two benches tend to be separated by a parting ranging from a few inches to a thick layer up to 16' thick comprised variously of clay, black to gray shale, and sometimes sandstone. Often only one of the benches was mined. The remaining bed may have been too thin or impure for recovery under the economic criteria employed at the time. The lower bench has been called the "Bear Creek" coal by some operators when the upper is the dominant economic bench. The Bloss coal probably correlates directly with the Lower Kittanning coal as evidenced by

similarity of plant fossils and petrographic characteristics of the coal.

The average 120 foot interval between the Bloss and the Seymour coal contains two, or possibly three, discontinuous and irregular coal beds. The lower coal, identified here as the Cushing, is typically found about 40 feet above the main mined Bloss coal and is reported to be 0.5 to more than 5 feet thick. The coal was named for the bed found at the Cushing mine just east of Antrim where the seam is well developed. The coal is reported to be dirty and pyritic in places.

The coal name "Morgan" is employed for the coal (or coals) which are found about 80 feet above the Bloss seam, but vary widely from that average interval. This coal has been reported to attain thicknesses of 5 1/2 feet locally east of Antrim. A conglomeratic sandstone commonly present just above the Morgan coal has been termed the "Monkey Ledge". Sandstone and sandy shale dominate the strata between the Morgan and the Seymour coals. The strata below the Morgan tends to contain more shaly members, though much sandstone is also commonly present.

The Seymour coal (D) exists only as remnants on the higher hills. This is the highest mined coal in the project area. The coal, reported to be about 3 feet thick, is persistent and is usually present about 120 to 140 feet above the Bloss. The Rock Vein (E?), about 170 feet above the Bloss, was not identified in the area and may be completely eroded away.

The geologic map (Plate II) delineates the position and lay of significant coals in the area as presently, understood. It should be emphasized that the strata are reported to be rolly in places and the area contains other suspected minor faults which could not be verified during this study.

Typical Columnar Sections for three mining complexes in the study area are

presented in Figures II through IV as a guide to strata encountered and their intervals for the specific area. Lateral and vertical variations in strata are extremely common.

#### References

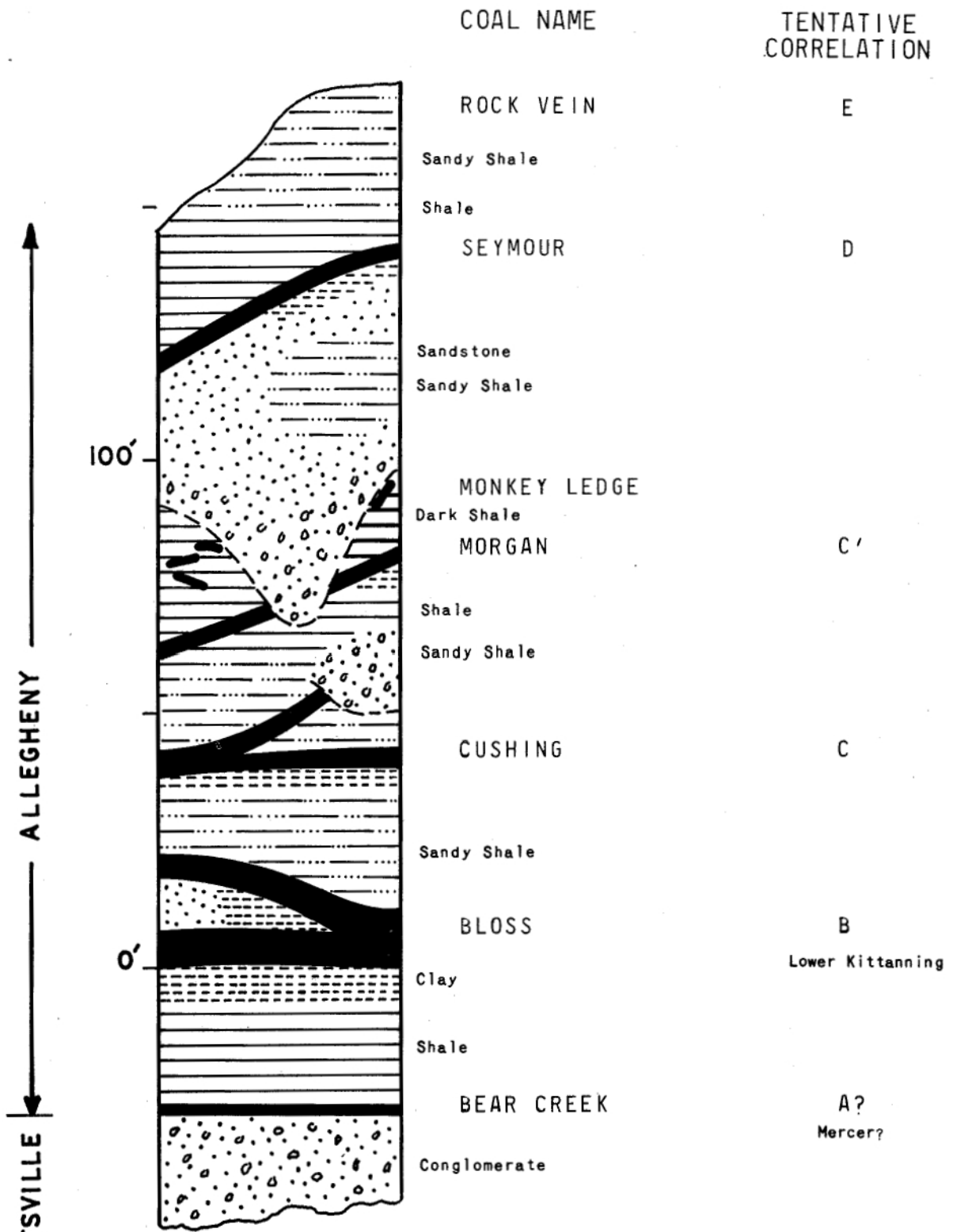
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FIGURE I

# GEOLOGIC COLUMN



1

2

# FIGURE II



Dark Sand Slate

SEYMOUR - 2'-3'6"

Sandstone

CUSHING - 1'6" (dirty)

Slaty Sandstone

Coal 0'6"

Coal 0'10"

Slate

BLOSS - 3'5"

Sandstone

BEAR CREEK



E Vein

Slate

SEYMOUR - 3'

Sandstone & Shale

Sandstone

Conglomerate

Dark Slate  
MORGAN

Slate

CUSHING - Slaty Coal 2'

Slate

Hematite Ore

BLOSS-UPPER BENCH

Fine Clay & Sandstone

BLOSS - 4 1/2'

Clay

Shale

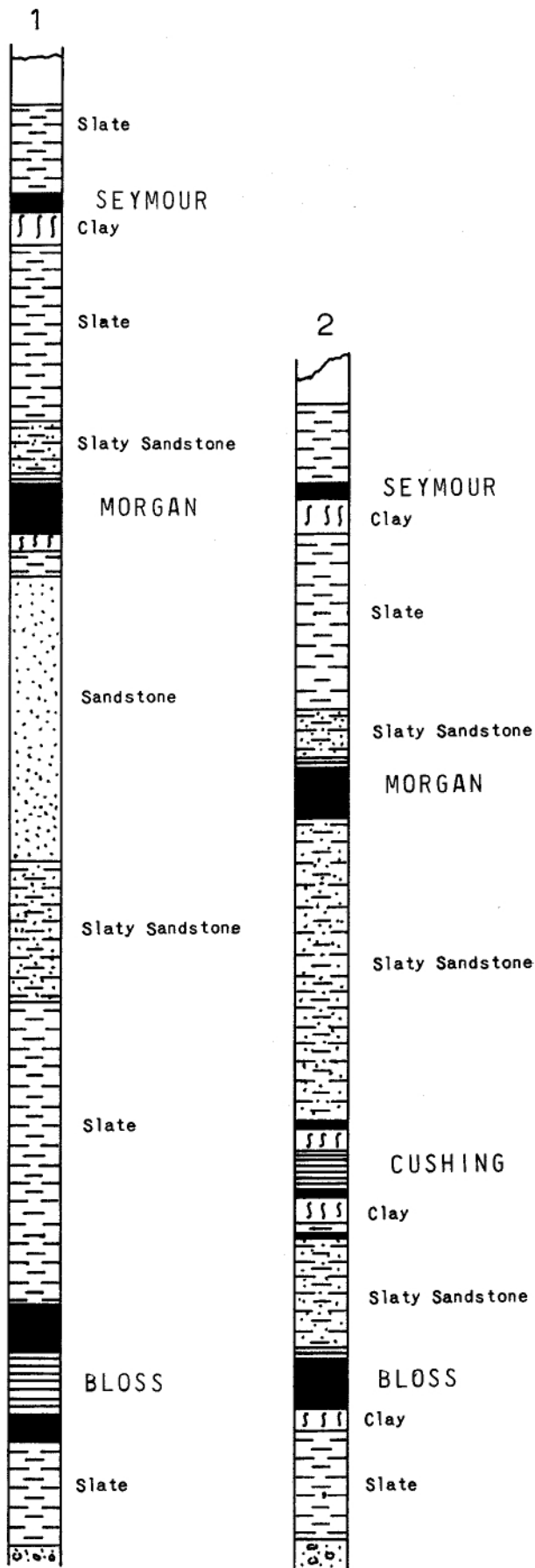
BEAR CREEK

## COLUMNAR SECTION ARNOT AREA

VERTICAL SCALE  
1" = 20'

- 1. REPORT G - SECOND GEOLOGICAL SURVEY
- 2. JAMES MACFARLANE 1877

FIGURE III



COLUMNAR SECTION  
 ANTRIM AREA  
 VERTICAL SCALE  
 1" = 20'

1. REPORT G - SECOND GEOLOGICAL SURVEY
2. JAMES MACFARLANE 1877

SOURCE - ANTOUN HARDT  
 FALLBROOK COAL COMPANY





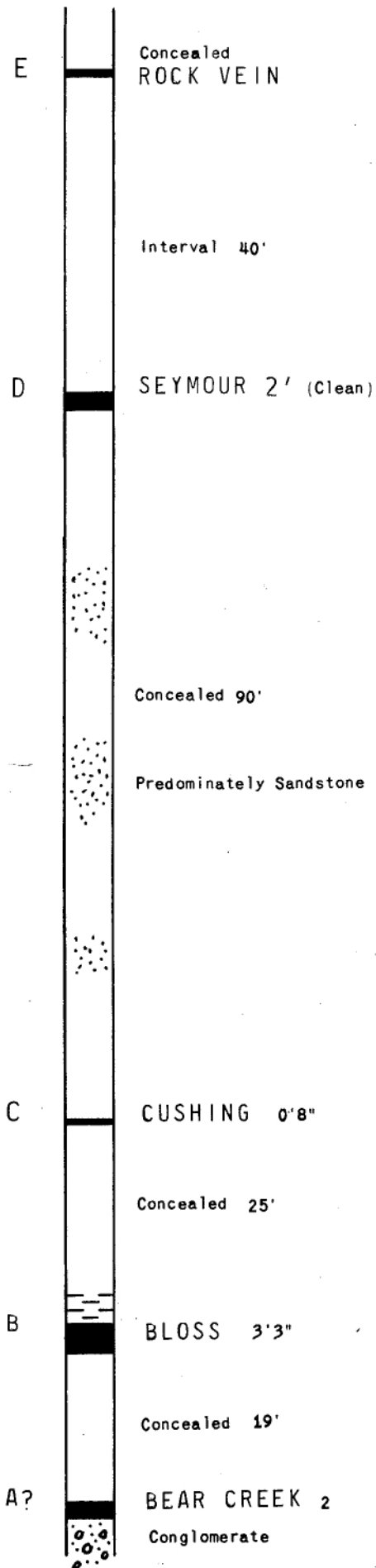
**FIGURE IV**

**COLUMNAR SECTION  
ANNA S AREA**

**VERTICAL SCALE  
1" = 20'**

**REPORT G - SECOND  
GEOLOGICAL SURVEY**

**BACHE MINE "10 MILES  
SOUTH WELLSBORO WEST  
SIDE OF WILSON CREEK"**



HISTORY OF DEEP MINING IN THE BABB CREEK WATERSHED

The discovery of coal at Blossburg in 1792 preceeded the humble efforts for its early development during the first 20 years of the 19th century. The first drift was thought to have been opened around 1815 on what was described as the "fifth vein from the surface". This became known as "Clemon's coal". Subsequent mining efforts near Blossburg were concentrated on the "sixth vein" called Bloss coal, which was described as a "lower vein of good quality". The "fifth" and "sixth" veins were reported to be only 11 feet apart.

The first mines in the Babb Creek Watershed were probably opened in Arnot around the year 1865. There is evidence the first mine in Arnot was located at the headwaters of Lick Creek, west of the village. Arnot No. 1, Arnot No. 2 and the Klondike Mine lie within the watershed, while the other mines were opened along Johnson Creek which flows to the Tioga River. The Blossburg Coal Mining and Railroad Company was formed in 1866 in order to develop this coal deposit on the Bloss vein. The railroad was extended from Blossburg, 4 miles northeast of the village site, which at that time was named Drakeville. Within 15 years Arnot had become the largest community in Tioga County, with 1,400 men working in the mines and a population of between 3,500 and 4,000.

In 1881 the Arnot and Pine Creek Railroad Company was organized and a standard gauge railroad constructed from Arnot to Hoytville, just south of Morris. A year later the Blossburg Coal Mining and Railroad Company built a sawmill along this railroad 5 miles southwest of Arnot and the village of Landrus became established. In 1888 the company opened the Bear Run Mines on the northern flank of the Babb Creek Valley opposite the new community of Landrus and by the year 1895 a force of 272 men was employed in the mine.

Production records from the mines at Arnot are not available; however, statistics from the mine inspector's report in 1895 may be comparative. This report showed the mines at Arnot (including the Klondike) produced 262,416 tons of coal, and those at Landrus (Bear Run Mine) produced 126,694 tons.

In 1885 the railroads owned by the Blossburg Coal Mining and Railroad Company were sold to the "Erie" and the company name changed to the Blossburg Coal Company. Prior to their closing, the mineral rights for the Arnot No. 1, Arnot No. 2, the Klondike and Bear Run Mines were transferred from this company to the Northwest Mining and Exchange Corporation.

Shortly after the opening of mines in Arnot, stockholders from the Fall Brook Coal Company incorporated the Lawrenceville and Wellsboro Railroad Company after explorations for coal in 1866-1868 on lands owned by William Bache proved favorable. These lands were located at the headwaters of Bridge Run, a tributary of Wilson Creek, near what later became the village of Antrim. Production from the Antrim No. 1 Drift did not begin on a large scale until 1872 when the railroad was completed. The early mining in Antrim was on the Bloss coal, although old miners have stated that both the ("B") and ("C") coal veins were later mined.

On the western flank of the Wilson Creek Valley the Fall Brook Coal Company also opened and developed the Anna S Mine on the Bloss vein. At one time coal from the Anna S was transported to Antrim via a cable bucket system extending across Wilson Creek. Records show the mines at Antrim produced 122,408 tons of coal in 1895. This probably does not include production from the Anna S Mine since there are indications the mine did not open until the late 1890's.

North of the Main Entry of the Anna S are several drift openings known locally as the Mitchell Mines. Early maps show this area to have been owned by the England Mining Company.

One mile west of the Anna S is the Rattler Mine which was opened in the early 1900's by the Tioga Coal Company. The mine was later owned by E. Manford Hart and Son until closing in 1958.

Of an estimated 8,000 acres of workable coal lying in the Babb Creek Watershed, there is evidence that over 4,000 acres were deep mined, primarily in the ("B") vein or Bloss coal seam. At the turn of the century production from mines in Tioga County had begun to decline as a result of increased production in Clearfield County, where coal was more economically mined.

#### References

Meagher, John. 1897. History of Tioga County, Pa. R. D. Brown and Co.