Early Mountain Railroads in the lower Pennsylvania Anthracite Coalfields during the 19th century

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Anthracite as a Commodity

- Hard, shiny coal with a high thermal output
- Pieces of coal burn on the surface only
- All pieces have to be approx. same size to burn in a grate
- Different size classes (Lump, steamboat, stove etc.)
- Requires extensive preparation plant on the surface (the coal breaker)
Historical Importance

- Among the earliest US coalfields to be developed
- Proximity to Eastern Seaboard
- Played a major role in fueling industrial development in the US prior to 1870
- Also of major importance as a heating fuel for urban dwellers (into 20th century)
The Coal Fields

• Four coal fields covering only 470 sq. miles
  – Southern and Western Middle fields (Schuylkill Region)
  – Eastern Middle field (Lehigh Region)
  – Northern field (Wyoming Region)
Early Coalfield Mining and Transportation Developments

- In the Northern field – along the Susquehanna and via the Delaware and Hudson gravity RR and canal
- In the Eastern Middle Field via the Lehigh canal
- However, the earliest major canal development (the Schuylkill Navigation - SNC) linked Pottsville in the Southern Field to Philadelphia in 1825
- This was followed by the Philadelphia and Reading RR in 1842
Southern Field Mining and the ‘Coal Laterals’

• The SNC canal to Philadelphia stimulated mining and coal land speculation in the incised valleys above Pottsville
• ‘Above water level’ drift mining was relatively cheap (no shafts or pumping required)
• Coal operators needed transport to bring coal from remote mines to the canal
• Hence the requirement for ‘coal lateral’ railroads extending progressively into the valleys – initially primitive, poorly capitalised and constructed, horse-drawn railroads
• Progressively switched to locomotives from 1830’s onwards
Major Coal Laterals

- Little Schuylkill Navigation, RR and Coal Co. (1826)
- Schuylkill Valley Navigation and Railroad Co. (1827)
- Mine Hill and Schuylkill Haven RR (1828)
- Mill Creek and Mine Hill Navigation and Railway Co. (1828)
- Mahanoy and Broad Mountain RR (1849)
- All were eventually leased by the Philadelphia and Reading RR during the 1860’s
Case Study:
Mine Hill and Schuylkill Haven RR

• Originally chartered to run from Schuylkill Haven on the canal below Pottsville to Mine Hill Gap
• Charter supplements and enlargements of its capital stock permitted a series of extensions to reach/open up new mining areas west of Pottsville in the Southern Field
• The most important of these early branches became the Wolf Creek branch where large and profitable mines were located (Gideon Bast)
MH&SHRR case study

- In 1847 the railroad finally decided to switch to locomotives, but this necessitated major changes:
  - Widening of the road bed so engines could pass on double tracks
  - Smoothing out undulating/severe grades and removing sharp curves
  - Rebuilding or strengthening most of its bridges
  - Building engine depot/roundhouse and machine shops
  - Building new water stations and wood depots
  - Laying all tracks with heavy rails (60lbs/yard) – this had commenced in the horse-drawn days because of the volume of heavy coal traffic
Mine Hill and Schuylkill Haven Railroad  Total Shipments (Coal and Merchandise) 1831 - 1865

Gross Tons

Year:
- 1831
- 1832
- 1833
- 1834
- 1835
- 1836
- 1837
- 1838
- 1839
- 1840
- 1841
- 1842
- 1843
- 1844
- 1845
- 1846
- 1847
- 1848
- 1849
- 1850
- 1851
- 1852
- 1853
- 1854
- 1855
- 1856
- 1857
- 1858
- 1859
- 1860
- 1861
- 1862
- 1863
- 1864
- 1865

Gross Tons:
- 0
- 200000
- 400000
- 600000
- 800000
- 1000000
- 1200000
- 1400000
- 1600000
- 1800000
- 2000000
The Ashland Extension and the Gordon Planes

• Despite repeated requests to extend the RR northwards into the Western Middle field, the managers did not take this forward until the early 1850’s owing to adverse terrain and cost
• Even then it was deemed advisable to use steam powered inclined planes at one point on the route
• These became known as the Gordon planes
• Completed in 1854 the two planes were each over 5000 ft long and overcame elevations of 313 and 404 feet
• The planes remained in use until 1898
Other Important Incline Planes

• The Mahanoy Plane on the Mahanoy and Broad Mountain RR – used for hoisting *loaded* coal cars up the mountain
  - Length: 2460 ft, vertical lift 524 ft; built 1861
  - After 1868 used 6000HP engines – some of the most powerful in the world at the time
• The Mt. Pisgah and Mt. Jefferson planes on the Mauch Chunk Switchback RR of the Lehigh Coal and Navigation Company; built 1845 to return *empty* cars to mines
  - Mt Pisgah plane: 2322 ft long, vertical lift 664 ft.
Concluding Remarks

• The mountain RRs of the lower anthracite fields developed from the necessity of moving large coal tonnages out of inhospitable terrain
• By the 1860’s they deployed heavy duty steam locos and enormously powerful stationary engines to expedite the movement of coal cars
• By this time, the Mine Hill Railroad alone had carried nearly 25 million tons of freight, almost all of it coal destined for wider markets on the Eastern Seaboard and beyond
• The ‘laterals’ had also greatly facilitated the expansion of mining across the lower fields, bringing capital and immigrant labour in large quantities to the anthracite regions