A Brief Historical Sketch of Londale’s Transportation Tenors

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One of the more significant aspects of the nineteenth century iron industry throughout all parts of the country was the availability of efficient and inexpensive transportation. The modes of travel which provided this vital and convenient celerity during the pioneer years of the iron industry directly affected virtually every aspect of the processes involved in the production and distribution of pig-iron. In fact, "transportation facilities might take more consideration than the location of raw materials" (All. Cnty, 21).

Initially, prior to the advent of the hotter and more efficient coke, the heat in the iron forges was readily provided by charcoal manufactured from timber supplied by the immediate environment. Quickly, however, timber sources were radically depleted forcing the various forges in the western Virginia area to mine and even import coal, and later coke, for their furnaces and chaferies. Most made themselves accessible to the outside markets by constructing cart tracks and using railroads. In addition, the location of a furnace, in order for the business to be economically successful, had to be proximal supplies of natural ore from which metal is extracted. After being stripped from open pits or excavated from subterranean mines, the ore was transported via carts down from the hills (Brushy Mountain in the case of Longdale) to an ore washer. Then, the desirable chunks having been selected, the ore continued down to the actual furnace by way of carts on rails pulled by small "dinky" locomotives.
The finished product, pig-iron, was then most often sent to a neighboring chafery where it could be further smelted. This process increased the value of the iron by smelting out impurities. All of these activities directly relied on adequate transportation methods. Ultimately, however, an economical method of shipping the raw iron to early markets or the east of the Alleghany Mountains, and later to the west, was required for the owners to receive a profit. The transportation of ore, coal, and iron were of primary importance to both Col. John Jordan and, later, William Firmstone, the two primary owners of the Longdale iron and mining complex believed to have stretched 13 miles "at the Botetourt border, where the Cowpasture and Jackson rivers meet to form the James" (All. Cnty, 21). These original means included primarily horse-drawn canal boats. These slow and often costly canals were soon replaced by the speed and capability of the train.

In my research for the systems of transportation present in the vicinity during the furnace's productive era, I discovered that the three primary modes of transportation available to the industry were horse-drawn wagons, canals, and various gauge railroads. The processes involved in iron mining, production, and distribution, as briefly outlined above, necessitated the application, over eighty-four years of activity, of all three modes of conveyance. This essay attempts to focus in three separate sections on each of the three distinct methods which were utilized by the men of the Longdale period.

First, however, a brief discussion highlighting the history of activities and procedures of the Longdale complex is required.
On Simpson's Creek, next to Brushy Mountain, John Jordan, and his brother, Edward, constructed the Lucy Salina charcoal furnace in 1827. "On the Jackson River, about eight or ten miles from the furnace, they built the Clifton forge that same year. The furnace and forge were located near navigable streams which provided the most economical route to the outside market" (All. Cnty., 21). This initial furnace was able to tap the nearby supplies of ore, limestone, and timber. Initially, "(h)eat was supplied by charcoal obtained from the wood in the surrounding forest" (Arritt, 55).

Iron, the area's most valuable mineral, is reported to have originally been exposed by the erosion of the Jackson River. "The rock which showed veins of iron was then hauled by cart or, if available, "Dinkys" (fig. 1) transported carloads of ore" (All. Cnty., 17). These "dinkys," which were used by the Firmstones, as demonstrated by a dated picture, then moved "...the ore to a washer where it was dumped mechanically" (All. Cnty, 17). An intriguing aside is the reported use of long cables called "monitors" where the terrain made the laying of railroad tracks impossible.

There were two buggies placed on a pulley system. The mine was higher than the railroad car or wagon which carried the ore away. Thus, a full buggy headed down a slope would force an empty one to the top of the system (All. Cnty, 17).

As nearby timber was rapidly cut and burnt for the charcoal needed to supply the Jordan family's single cold blast furnace,
the fuel had to be carried increasingly greater distances. To compete with a new hot blast furnace built near Covington in 1849, Jordan constructed a hot blast furnace of their own “nearer to the mouth of the creek than the old one and called it Australia” (All. Cnty, 22). In 1861, the Confederacy used the furnaces, under the supervision of General James R. Anderson (RHS), to produce iron for big guns, cannon balls, rails, and “rolling stock for the railroads” (All. Cnty, 22).

“Despondent over losing slaves at the close of the War Between the States, Col. Jordan hanged himself ...” (Arritt, 56). Four years after Jordan’s death, the Lucy Salina furnace and “… accompanying lands in Alleghany and Rockbridge Counties were sold to a man named William Firmstone” (All. Cnty, 22) and his brother, Harry. They fired up Lucy Salina again in 1870 and, in 1874, for the first time in the state of Virginia, they pioneered the use of coke to replace charcoal as the heating agent. William died in 1877, and his sons, Frank and Harry, followed their father by later adding a second Longdale furnace around 1881 (All. Cnty, 22). “The ore for the furnace was procured at Longdale mines, on the southeast side of Brushy Mountain. These mines had the greatest production of any in Virginia, producing in 1889 80,452 long tons” (Scott, 8). Both furnaces “operated without shutdown until 1911” (Scott, 8) when the furnaces at Longdale were closed due to a lack of orders for their iron products.

WAGONS and ROADS

The nineteenth century roads of Alleghany and the surrounding counties were scarce and by today’s standards in deplorable
condition. Surprisingly, not until "... 1763 [was] the first road ... authorized and built, and, soon others followed. It is said that these roads were surveyed following to a great extent the buffalo trails as they existed" (Hamilton, 58). By the turn of the 19th century, the iron industry had its advent, and concentrated around the rich ore deposits found in Alleghany County. As reported in *A History of Roads in Virginia*, "it became mandatory for a county in which an iron furnace was operated to provide 'good roads to be laid out and made from such works to the nearest place upon some navigable river or creek' " (3). This quote foreshadows the overt importance of canals in the overall scheme of transportation through the area.

It may surprise the reader to learn of the significant role which Col. John Jordan actually played in the orchestrating of the construction of the same routes across the land and waters of western Virginia which he would later utilize to transfer his iron products to eastern markets once he settled down and encompassed himself in the business of the iron industry: "Jordan was a contractor on the Blue Ridge Canal and the Lexington and Covington Turnpike. He built dams, mills, furnaces, forges... He and his sons cut part of the Plank Road ..." (Bland, 227). Furthermore, John Jordan, along with John Irvine, was in earlier days involved in the river freighting business. "Since their shipments included iron products of Botetourt and Rockbridge, it is not surprising that their next endeavor would be in iron making" (All. Cnty, 21). During Jordan's period of ownership of the forges in Longadale, all business and sales were made through the
east coast. In fact, the first principle road which "... emerged in 1827 as Virginia's bid for the Ohio River ..." (Roads, 6) was the Northwestern Turnpike. This route was too arduous and timely a journey for the products of the Lucy Salina and Australia furnaces. Therefore, Jordan made the profit-oriented decision to ship along the pre-existing roads and road-linked-canals to the east. The necessity arose to construct a "... good wagon road through North Mountain to have access to the furnace" (Corron, 5). The road would create ways for the iron and materials to be transported by wagon both to the Lucy Salina, which was under construction at the time, and the alternate canals and railroad depots, none of which were originally directly connected to the Longadaie and Clifton areas. However, the Rockbridge County authorities were unwilling to undertake such a feat:

They told Jordan it couldn't be done, so Jordan offered to build the road if they would give him the men. The offer was accepted and ... (t)he colorful Colonel Jordan, well acquainted with work, supervised and constructed the first road across the lofty North Mountain between Lexington and Clifton Forge ... completed in 1826 (Corron, 6).

For many years afterward, the road was used by the drivers of both Jordan's and Firmstone's eight-horse wagons. It was named the Old National Highway and later became a segment of the County's infamously treacherous Midland Trail. The road built for eight-horse wagons is close to the present-day U.S. Route 60. During the years immediately after the stresses of the
Civil War and before Jordan's reported suicide, competition in the industry became fierce, "... and Jordan was forced to suspend operations at Lucy Salina and Australia on Simpson's Creek, partly for the reason that Cloverdale and other furnaces had a shorter haul to the canal head at Buchanan, and therefore a price advantage" (Bland, 224).

At this point in the history of Longdale, William Firmstone took control and correctly decided to convert the furnaces to coke. Coke was perhaps the dominating factor which forced him to look towards alternate routes - to look towards the West. The trains and canals he utilized to import the coke from West Virginia will be discussed later.

However, there were several additional relevant turnpikes and "super-highways" present in the immediate area before Jordan surrendered control of his furnaces. These include Lexington and Covington, 41 miles; Jordan's furnace and Rockbridge, 18 miles, 1849; Knawha, 94 miles, 1820; and Southwestern, 175 miles, 1846 (fig. 7).

Although roads were probably the least significant form of transportation to Longdale, their role should not be demphasized. Undoubtedly, the goods (foods, clothes, tools, etc.) which were essential for the daily maintenance of the furnaces and the Longdale community were brought from Lexington by way of the Old National Highway. These same horse-teams most probably were also used to transport the timber of the early forests necessary to create the charcoal for the ovens. Finally, and most importantly, these wagons often aided in the conveyance of the pig-iron from
the furnaces to the actual canal ferry heads and railroad stations before the Longdale Station on the Chesapeake and Ohio Railway was constructed.

CANALS

Although roadways and turnpikes were readily used by the owners of Longdale to convey their iron to the canal heads for shipment to eastern markets, the horse-power they relied upon to pull their wagons was employed to pull the barges along canals and other water routes. The primary canal situated for convenient usage during Col. Jordan’s time was the James River and Kanawha Canal (fig. 9). A brief sketch of the canals early history and growth is needed at this point. However, even before the James River was converted for canal traffic, the iron from Jordan’s “... old furnace ... was then loaded on long bateaux and sent down the (upper James) river to Lynchburg with men who supplemented the force of the current occasionally with long poles against their padded shoulders, by walking from front to back of the boat to send it along” (Corron, 8).

A map of the principle canals developed by 1860 illustrates that by this time, the James River and Kanawha Canal had only been extended from Richmond to Lynchburg (fig. 12). Plans to extend this canal westward to the Ohio were proposed but, due to financial considerations, were delayed: “A turnpike across the mountains had already been constructed, and the canal won no new appropriations” (Shaw, 114). The canal was at its peak from 1851 to 1861. “Seventy-five deck boats, sixty-six open boats and fifty-four bateaux powered by more than 400 horses and mules
trotting along the tow paths, traveled the James River at about four or five miles an hour" (Shaw, 113). Due to the minimal transportation options available to Jordan, he was forced to look eastward for all sales of his iron. "The James River Canal runs to the base of the Alleghanies on the east, and the Kanawha River Canal will soon be completed to the base of the Alleghanies on the west" (Lowe, 9). As proposed by the state's chief transportation architect Crozet, a railroad would then be built through the Alleghanies to connect the two canals. This plan was undoubtedly the most practical, but was not carried out during Jordan’s tenure as owner before the Civil War. For this reason, and because the utilization of long-distance railroads was at this time impractical, the pig and forged iron were sent down the Jackson River to the James on floats to Lynchburg. All of the products from the Lucy Salina and Australia furnaces had to be shipped to east coast markets such as Richmond (through Lynchburg - fig. 9).

The fact that Jordan was physically restrained from turning to the western markets rapidly growing along the Ohio River Valley should be revealed. For Jordan "(t)he iron was taken down the James River to the falls of the James where it was loaded on canal freighters to be taken to Richmond. At Richmond the iron could be loaded on ocean going vessels for transportation to places such as Baltimore, Philadelphia, or New York" (All. Cty, 21). Due to the Civil War, the James River and Kanawha Company were unable to complete the canal all of the way to Buchanan and Covington in the process failing to open Virginia and its goods to the Kanawha River Canal and the Ohio Valley. After the war
between the states, the company was forced to seek a loan to pay their outstanding floating debt. "Their appeal came at an opportune moment; for there was a growing conviction that railroads failed to meet the demands of certain regions of the West in transportation of heavy and bulky freight" (Farnam, 272). Surprisingly, however, the National Government then intercepted the construction process and, in an attempt to secure a "central water-line," expressed sincere interest to complete the project through the Alleghany Mountains. All of these events occurred at the same time the Firmstone family was initiating their initial plans for the dilapidated furnaces at Longdale (early 1870's). A turnpike connecting the James and Kanawha Canals was then built due to a sudden abandonment of interest by the Government in completing the canals (fig. 4). Soon after this loss of interest, the work of the James River and Kanawha Canal Company "... were purchased by the Richmond and Alleghany Railroad Company" (Farnam, 173) in 1880 (fig. 2).

The purchase of the canal by a railroad company exemplifies the fact that throughout the country "canal revenues ... began to decline as railroad mileage increased. The period shortly before, during, and shortly after the Civil War (Jordan and then Firmstone) signals a crux in the history of transportation in the United States. By the cessation of industrial activities at Longdale, the furnace had progressed from relying on turnpikes and canals to mountain traversing locomotives for transporting their goods to the market. One also realizes that in this time trade shifted from the old markets of the east coast (reached by Jordan with canals) to the rapidly expanding settlements of the
west (reached by Firmstone with railroads). The ton-mileage advantages of the revolution can be seen in the accompanying table (fig. 3). Thus ended the practicality of using turnpikes and canals at Longdale.

TRAINS

With the revelation that trains were the most efficient means of transportation for, among other goods, even Longdale’s burdensome iron products, the Firmstone’s anxiously looked toward the construction of railways through the area. Although the South Side Rail Road had few lines located in the Alleghanies, the rates of shipping furnish the reader with an accurate estimate of the costs involved in transporting coal to and from the furnaces (fig. 10). Albeit that railroads began to be constructed in Virginia as early as the late 1820’s, they served mostly to connect ports on the coast and fall-line cities (Bland, 225). “Yet by 1827 the B&O was planning to capture the Valley trade as far south as the Buffalo Gap - Panther Gap - Covington route that later would be followed by the C&O” (Bland, 225). The 1888 map of the Baltimore and Ohio Railroad and its connections vividly illustrates the extent to which railways had progressed (fig. 8). The map also points towards the belief that the Longdale area was far from culturally and physically remote – a major line of the B&O extends up to Lexington while through cars ran as close to Longdale as Goshen and Clifton Forge. Though a station is not listed at the actual Longdale location along the B&O Railroad, in my research I discovered that the later Chesapeake and Ohio
Railroad soon placed a terminal in the area (fig. 6).

The often mentioned "narrow gauge railroad" built to link the mines to the furnaces were used by the small "dinkys" common among mining operations of the time period. These narrower tracks (fig. 5), as opposed to the standard gauge, 4 feet 8 1/2 inches (Holland, 265), were probably not used during Col. Jordan's ownership to the extent that they were utilized later. The reader learns that the progression and growth of the railroad in the Alleghenies had reached Longdale by the actual fabrication of Longdale Station along the Chesapeake and Ohio rail: "...13-mile spur track over which the ore was hauled from the slopes of Bushy Mountain to the furnace at Longdale Station for shipment ..." (Scott, 1). "Longdale Station being on the main line of the Chesapeake and Ohio Railroad, two miles east of Clifton Forge" (Arritt, 112).

Another report concerning the Longdale Iron Co. interestingly reveals that "Longdale's iron was sold almost entirely west of the Alleghenies. Nearly all shipping was done by rail" (All. Cnty, 22). This fact implies that the Firmstones failed to employ the Buchanan and Clifton Forge Railway Co. organized in 1876 "...to provide transportation from the end of the canal at Buchanan to Clifton Forge ..." (Corron, 12). This line connected with eastward bound water transportation. Both the use of canals and other ways of shipping to eastern markets are two definite inconsistencies with Firmstone's reported market initiatives. Rather, he chose to send his products westward as illustrated by the Longdale depot (constructed in 1873 - Arritt, 56) along the C&O
three years before the plans for the railway to the James River Canal (to the east) had even been planned. The perspicacity behind Firmstone's decision, as demonstrated by literature about the conveniently located C&O line, states:

The line runs through the most populous counties of Virginia and West Virginia, and when it reaches the Ohio River it will have the advantage of an enormous western, southwestern and northwestern traffic already made to its hand. No railway ever constructed across the Alleghanies has had, at the outset, a traffic of such magnitude as the Chesapeake and Ohio line will possess (Lowe, 8).

Longdale, with the change from burning charcoal to using coke in their new furnace, was forced to import the nearest available coke. Thus "(a) narrow-gauge railroad was constructed to their own coal mines in West Virginia ... [which] was part of the Chesapeake and Ohio Railroad system" (RHS). Firmstone obtained large coal holdings associated with coke ovens along the New River in West Virginia to assure a consistent supply of the necessary high grade coke. The switch from charcoal to coke, in addition to the railway options increasing daily to the markets of the Ohio Valley, are both two dominating factors which compelled the Longdale Co. to turn to the west for sales of its iron.

Indeed, although routes to send Longdale's products westward did exist as early as the late 1820's, the arrival of the Chesapeake and Ohio Railway, with its double track lines to such major
cities as Louisville, Cincinnati, and even Chicago (fig. 11) would have most definitely aided the company’s survival if the lines had been constructed earlier.

In the end the Longdale Iron Co. was unable to compete with its competitors in the north. The expenses of subterranean mining and importing coke made the iron more costly than others in Pennsylvania where the ore was purer and mined with greater facility. However, the relevant records of transportation practices of the early Lucy Salina and later Longdale complex, though often sketchy and contradictory, provide a broader understanding of the sight, its birth, development, and eventual demise.

What are the sources for the figures which follow?
Stacks of railroad ties on the James River and Kanawha Canal towpath presage the end of the canal-boat era.

### Comparative Advantage of Various Means of Conveyance

<table>
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<th>Avg. Load (tons)</th>
<th>Speed (mph)</th>
<th>Horsepower (hp)</th>
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<td>2</td>
<td>10</td>
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<tr>
<td>Wagon (x 4)</td>
<td>2</td>
<td>2</td>
<td>20</td>
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<tr>
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<td>10</td>
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<tr>
<td>Early Train</td>
<td>20</td>
<td>20</td>
<td>2000</td>
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Figure 1.

Figure 2.

Figure 3.
JAMES RIVER & KANAWHA COMPANY
FROM THE CITY OF RICHMOND
TO THE OHIO RIVER

Point Pleasant
Ohio River
Huntington
Charleston
RIVER
Alleghany

Mountains

Turnpike
Covington

Lexington
Buchanan

Ridge

Lynchburg

Lexington

Kanawha

Charlottesville

Richmond

Figure 4.

Longdale Street and Mine Tunnel

Figure 5.
Nineteenth-century transportation facilities in Rockbridge County. The modern highways (US 11 and US 60) follow old trade routes. The turnpikes shown are the Lexington and Covington (L & C), the Millboro and Kern Creek (M & K), the Natural Bridge and Clifton Forge (NB & CF), Jordan's Furnace and Rockbridge (JF & R), and William Weaver's Goose Pass (GP). Boat landings on the North River Canal are shown as stars (*) and boatyards on the North (Maury) River are shown as diamonds ( ).
THE SHORT LINE
— BETWEEN —
The Mississippi, the Great Lakes and the Atlantic.

NOTE CAREFULLY THE VAST EXTENT OF COUNTRY COVERED BY THE
BALTIMORE & OHIO LINE
AND TELL THE TICKET AGENT JUST HOW YOU WANT YOUR TICKETS.
Figure 4.

TOPOGRAPHIC MAP COVERAGE FROM RICHMOND TO COVINGTON
Principal Canals Built by 1861

Based upon "Canals, 1785-1850 and the Cumberland Road" Atlas of American History, 1984
Works Cited


"Lucy Salina Furnace." Rockbridge Historical Society, Miscellaneous: Mining Industry.

