

CLOVERDALE FURNACE: A CENTURY OF IRON MANUFACTURE IN
BOTETOURT COUNTY
VIRGINIA, 1789-1889

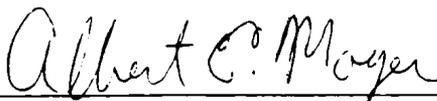
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Chapter I

A BRIEF HISTORY OF VIRGINIA IRON PRODUCTION, 1607-1789

On December 19, in the year 1606, the Virginia Company of London sent its colonization expedition to the New World. In addition to his instruction that the company establish a protected village and map the surrounding topography, King James I had instructed the party to carry with them shovels and pickaxes in order to explore the natural resources. Captains Christopher Newport and John Smith believed that Virginia was rich in gold, copper and iron. Dreams of returning home with wealth equal to that which the Spanish had found in South America was encouragement enough for early mining ventures. Unfortunately, the yellow metallic deposits that the colonists discovered and mined turned out to be pyrite, or fool's gold. Reluctantly, they settled on iron ore as the only mineral worthy of export.

At first, the iron ore was used as ballast on board the ships returning to England in place of the more marketable products that the Company had anticipated. However, when the ore ballast was eventually smelted in England, it proved to be of good quality and quite valuable.¹

¹ Robert Beverley. The History and Present State of Virginia, New York: Bobbs Merrill Co., 1971.

In 1620 and 1621, the Company sent to its colony 150 workmen experienced in iron manufacture, for the purpose of constructing three new ironworks. Of the three, only one actually reached production potential. This was located on Falling Creek in present Chesterfield county. Its ironmaster was John Berkely, a man of apparent experience and dedication, and who was expected by the Company to produce high-grade iron. In the great massacre of March 22, 1622, Indians killed Berkely and completely wiped out this establishment along with the other improvements undertaken by the Company.²

The first permanant and productive iron furnace was built in the colony of Massachusetts where John Winthorp, Jr., took the lead in establishing an iron works on on the Banks of the Saugus River in 1647. Subsequently, numerous other furnaces, forges, and slitting mills were erected, helping to secure New England's early iron producing superiority. Seventeenth Century Virginia's primary concern was tobacco and did not attempt to alter the situation. However, it would be unfair to say that the notion of iron smelting faded completely. More precisely, it was tobacco

² Bruce, Philip A. Economic History of Virginia in the Seventeenth Century. New York: The Macmillan Company, 1895 pp. 448-449 and Arthur C. Bining, British Regulations of the Colonial Iron Industry. p.7 "The lighting of the furnace was the signal for the terrible massacre to begin."

fever that shrouded it for nearly one hundred years.

The next major attempt at producing Virginia iron did not take place until early in the 18th Century, when Alexander Spotswood, William Byrd, and Robert Carter began laying claim to mines of any resource, especially those which contained gold, copper, and iron.³

In 1719 Spotswood built a blast furnace on the Rappahannock and Rapidan Rivers near Fredricksburg. A Swiss intermediary, Baron Christopher de Graffenreid, provided experienced Swiss workmen and, consequently, built the settlement of Germanna.⁴ Spotswood's establishment was particularly suited for the production of iron. The frontier environment not only provided the natural resources of wood, ore and flux, that were necessary, but also conditions favorable to semi-skilled labor and low capital

³ Kathleen Bruce. Iron Manufacture in the Slave Era. New York: Augustus M. Kelly, 1968, (reprint from 1930), pp. 6f.

⁴ Alexander Spotswood. Iron Works at Tubal. with introduction by Lester J. Cappon, Charlottesville; The Tracy W. McGregor Library of the University of Virginia. 1945 pp.7-8 There is some question about the nature of this labor force. Their ready availability stemming from de Graffenreid's failure in North Carolina coupled with Govenor Spotswood's shrewd plans for establishing a fort (or buffer settlement) above the falls of the Rappahannock, suggest that there was more to the establishment of the Germanna and the Tubal Ironworks than is at first evident. Nevertheless, Germans and Swiss were well known throughout Europe for their iron manufacturing skills. Often ironmongers hired European ironmasters to come to the United States and supervise iron industries.

out-lay.

As the "Tubal Cain of Virginia" Spottswood constructed the furnace to meet an international market.⁵ This was in direct contrast to the smaller local furnaces and "bloomery" forges which appeared after 1720. They were designed to provide iron to local markets and plantations exclusively. Often small forges were built on large plantations. The vast gap in capital investment and operational logistics between smelting iron in a forge and a furnace, was enough to encourage a forge and discourage a furnace. A forge could be constructed in a very limited space and operated by a limited labor force. A furnace required extensive capital, labor, and resources not only to build, but also to keep in blast. Likewise, furnace production often delivered too large a quantity for planters who were answering the needs of self-sufficiency rather than producing for market.

That it was Baltimore, rather than Fredericksburg, which eventually became the center for iron manufacture and trade was due to the superiority of the former's deep-water port compared to the latter's site on the long, shallow Rappahannock. However, by whatever route for export, in whatever town for manufacture, between 1750 and the American

⁵ Charles, Campbell. History of the Colony and Ancient Dominion of Virginia. Philadelphia: J.B. Lippincott and Co., 1860. p. 405.

Revolution, Virginia iron manufacture emerged as a lucrative business.

The outbreak of hostilities between Britian and the colonies marked a major change in colonial iron production. Prior to the war, British laws had prohibited colonial ironworks from producing weapons or ammunition of any sort. In theory, this conformed to the tenets of mercantilism. The colonies would provide the mother country with the raw materials necessary to produce a given product. The product would return to the colonies as an import thus providing the mother country with a continuous market.⁶

In addition to conforming with the idea of mercantilism, this restriction also kept the manufacture of ordnance safely out of reach of would-be rebels. If the States and the Continental Congress were to supply their armies with muskets of American manufacture, they first had to build foundries, then locate existing gunsmiths or train new ones. Otherwise, recruits would have to continue to arm themselves.⁷

⁶ Richard, Lee Morton. Colonial Virginia. (2 vols., Chapel Hill: The University of North Carolina Press. 1960 p. 528.

⁷ Ibid p. 126

Virginia's iron production enjoyed a permanent increase as a result of the Revolutionary War. She continued to exploit deposits of the rich brown hematite ore which lay along and west of the fall line, using existing facilities near Fredericksburg and developing new ones through generous subsidies to entrepreneurs. One individual who established such an iron furnace was David Ross, a wealthy tobacco planter who lived 40 miles west of Richmond. He built the Oxford Iron Works between the years 1775 and 1776 in present Campbell County on the James River, eight miles from Lynchburg. By 1780 he was acting as "Commercial Agent for the State with primary responsibilities for supplying Virginia troops with clothing, ordnance, lead, and other important military stores."⁸ His quest for high quality and abundant ore led others across the Blue Ridge into transmontane Virginia. From Frederick County to Wythe County, ironworks sprang up supplying the needs for securing independence from the mother country.

As the supply and demand for iron increased between 1770 and 1780, so also did the price of bar and pig iron. In 1772-1775, Robert Carter and his fellow shareholders at the Baltimore Ironworks had sold bar iron to Londoners for

⁸ Charles Dew. "David Ross and the Oxford Iron Works" William and Mary Quarterly (hereinafter cited as WMQ) 3rd ser., XXXI (April, 1974), 191-192.

£26 per ton and pig iron for £8 per ton. During March of 1777, bar iron brought £34 per ton. A year later it fetched £45 per ton. Even though the Commonwealth of Virginia restricted demand by prohibiting out-of-state deliveries, bar iron sold for £88 per ton by the end of 1778.⁹

Naturally, the market for iron slumped after the war. The old forges and foundries, as well as the new ones which were built during the war, could continue their existence only by balancing domestic demands with export stock. Although the industry was still a good business, greater reserves of capital were needed to survive this period of contraction. Fortunately, foreign trade began to pick up around 1786 and improved with the low tariffs which prevailed after 1789. As a result, the American domestic economy blossomed upon the creation of a national interstate economy during the first Washington Administration. Primary and secondary manufacture of iron in the Old Dominion responded to this stimuli.

In Virginia, as in the nation, the westward movement encouraged the quest for and discovery of iron deposits which in turn called forth the establishment of new furnaces. The new frontier of 1763-1776 became the old

⁹ Louis Morton. Robert Carter of Nomini Hall.
Williamsburg; Colonial Williamsburg Press. 1945 pp.
166-169

frontier of 1787-1812. While the rapid increase of furnace construction continued in Virginia's southwest, frontier profit was largely dependent on agriculture. Some of the iron production beyond the Virginia fall line was sent to the coast where it was shipped to Europe, but this was the case for the well established furnaces such as David Ross's Oxford Ironworks and not the newer and smaller ones. The Oxford establishment rested on several years of domestic trade connections. The newer furnaces had to cultivate a local market until they gained sufficient capital to pay the cost of transportation.

If Ross had anything to worry about with his Oxford Furnace, it was not trade. More likely he feared the inability to collect wartime debts. Extended credit could quickly bankrupt even the most stable institutions. Moreover, ever since the 1780's, Virginia had recognized the need to pay back her war debts both foreign and domestic. North Carolina and Virginia were quite successful in eliminating their debts long before the assumption controversy in the new Congress of 1790. Consequently, they held little favor for such a consolidated measure. Such a process would profit other states who had been delinquent in their payments. "I believe the assumption will take place in the form in which you now see it in the public papers.

It has been so shaped principally to help Massachusetts and South Carolina the two states most in need of it, and Virginia the most opposed to it on account of the great progress she has made in paying her debt."¹⁰

Under the Articles of Confederation there was a tremendous need for establishing an effective means of acquiring revenue. In keeping with British tradition it was agreed upon that tariffs and tonnage duties would constitute the largest portion of such collections. Americans consumed a considerable amount of foreign goods; nearly fifty percent of which were transported on foreign vessels. The implementation of such measures would greatly ease the operational demands of the new Government as well as satisfy the interest and principle of the remaining debts.¹¹

In addition to providing revenue with which to pay back foreign and domestic debts and stabilize the workings of a central Government, many political leaders saw tariff protection as a tool of diplomacy. The idea being that duties on imports would act as a weapon attracting foreign respect and establishing trade regulations. In 1789 this

¹⁰ Thomas Jefferson To Thomas Mann Randolph, July 25, 1790, The Papers of Thomas Jefferson. 20 Vols. to 1782., ed:by Julian P. Boyd et al., New Jersey; Princeton University Press., 1950 - - XVII, 274ff.

¹¹ John Miller. The Federalist Era, 1789-1801. New York; Harper and Row Publishers., 1960. p.15

was by far the most urgent concern of the new National Government. The United States could not long endure without the support of rigid commercial ties with the other countries.¹²

In December of 1793, Thomas Jefferson submitted to Congress his Report on the Privileges and Restrictions on the Commerce of the United States in foreign countries.¹³ In this report the Secretary of State examined the conditions and the expectations of United States foreign trade. The focus of such concern was broad by definition, but in reality relations with France and England made up the largest portion.

As an idealist Jefferson saw the beauty of international free trade.

Instead of embarrassing commerce under piles of regulating laws, duties and prohibitions, could it be relieved from all its shackles in all parts of the world, could every country be employed in producing that which nature has best fitted it to produce, and each be free to exchange with others material surplusses for mutual wants, the greatest mass possible would be produced of those things which contribute to human life and human happiness, the number of mankind would be

¹² Merrill D. Peterson. "Thomas Jefferson and Commercial Policy, 1783-1793" William and Mary Quarterly 3rd ser. (herein cited as WMQ), 3rd ser., XX (Oct. 1965.) 584-610.

¹³ "The Report on the Privileges and Restrictions on the Commerce of the United States in Foreign Countries" The Writings of Thomas Jefferson., 10 Vols., ed. by Paul L Ford 1885. New York: Putnum's 1892 - 1899.) VI, 470.

increased and their condition bettered.¹⁴

In theory this was a monumental vision, but impractical. Therefore, the Secretary of State had to compromise his ideas before serious ovations could be made.

France always maintained a special position in Jefferson's heart. In part this circumstance was derived from his familiarity with the young Republic during his Ministry and respect for the Republican ideals that France was striving to establish as the foundation of her Government. On the other hand, England was not graced with such feelings. To Jefferson this despotic land, which controlled three-quarters of American imports and one-half of the exports, was a country to be feared and held in suspicion.¹⁵

In order to eliminate the threat of British control of United States commerce, Jefferson suggested that duties be levied on all imports, but with greatest pressure on Great Britain. In this way the United States would have something to bargain with during future attempts at establishing mutually accepted trade regulations. For the most part Jefferson found support for his plan in the growing

¹⁴ Thomas Jefferson To George Washington, September 9, 1792, The Writings of Thomas Jefferson. (Ford ed.,) VI, 479.

¹⁵ Merrill D. Peterson, "Thomas Jefferson and Commercial Policy, 1783-1793," WMQ, XX (October, 1965.) 586.

Rebulican faction. Republicans feared the controls which Great Britian maintained on economic and political aspects of the United States. However, this was not so with the Federalists. The majority of their number saw Britian not as a threat, but rather as a necessary ally essential to the future development of America. Alexander Hamilton was especially vocal in this respect.

Hamilton attributed more or less equal importance to industry, manufacture and to agricultural production. They were all necessary in order to provide a stable foundation for the country. His overriding concern was, however, with United States foreign trade characterized by neo-colonial exchange of American foodstuffs and raw materials for British manufactured products. Hamilton's celebrated Report on Manufactures, may have looked forward to the day when there might be an American industry to protect, but the Secretary of the Treasury did not allow such speculative enthusiasms to interfere with a low tariff designed to generate a high volume of imports on which customs duties might be levied and which would provide the means for financing the National Debt.

Of particular interest to Hamilton and his Federalist followers was the long-term growth of the iron industry. His 1791 Report which enjoyed the assistance of Tench Coxe,

surveyed the nation's most vital manufactures and their intimate relationship with national economy. Hamilton said of the iron industry:

manufacturers of this article are entitled to preeminent rank. None are more essential in their kinds, nor so extensive in their uses. They constitute in whole or in part the implements or materials or both of almost every useful occupation. Their instrumentality is everywhere conspicuous.¹⁶

Although Hamilton considered that the iron industry in America received adequate protection in the 1790's, he advocated additional duties at an unspecified later date to encourage the industry.

In the last decade of the 18th Century Virginia took a renewed interest in the iron industry. Only slightly was this activity checked by growing concerns with agrarian pursuits.¹⁷ In 1790, there were sixteen blast furnaces in the state. A number which was second only to Pennsylvania where there were forty-four. Maryland, on the other hand, only had nine, furnaces but their output of 5,500 tons was proportionally more efficient and intense than Virginia's output of 6,930 tons. Furthermore, the value of Maryland's

¹⁶ Alexander Hamilton, The Papers of Alexander Hamilton. (26 vols. ed. by Harold C. Syrett & Jacob Cook. New York: Columbia University Press.) 1961 - 1979. X, 314.

¹⁷ James Swank, History of The Manufacture of Iron in All Ages: and Particularly in the United States from Colonial Times to 1891 Philadelphia: 1892. reprint New York; Burt Franklin,. p269.

iron totaled \$249,653 while Virginia's iron was only \$171,312.

What may appear as a loss of interest in iron manufacture was actually a matter of transportation and market specialization. The pre-Revolutionary advantages of Baltimore over Virginia ports had been accentuated by the burning of Norfolk in 1776. In effect this left the furnaces and forges of Virginia to depend largely on local or plantation markets.

However as indicated, growing Post-Revolutionary Virginia iron interests enjoyed a significant upswing during the 1790's and this was not restricted to pig and bar iron production. Other areas of iron usage heretofore dominated by Northern states began to take hold in the Old Dominion. One example of this is casting work. Hollowware, including pots, kettles and other cast implements, became important market materials. The number of such pieces increased from 0 in 1790 to 6,160 in 1793 and by 1800 total profits from such endeavors amounted to \$11,174.

Gunsmithing was another such area of iron work which enjoyed an increased popularity towards the end of the 18th Century. At this time Virginia had the highest number of rifle makers throughout the union. There were 1,720 gunsmiths who specialized in rifles and another 3,468 who

worked on other types of guns. Two other areas in metal working that flourished in Virginia were--- sword making and steel manufacture. In 1790 there were only eleven steel furnaces in the country; one of which was in Virginia. The total value of this industry's production for that year was \$3,700. For the same year the total value of swords made was \$5,000. Virginia was the only state making swords at the time.¹⁸

Overall, the majority of the new furnaces which were built in Virginia at this time were developed only to serve the economy of the old frontier. Often a large plantation would construct a bloomery or a furnace simply to provide the simple farm equipment needed for its own farming establishment. Frequently if a planter owned small iron deposits he tried to profit by developing his own means of production on a small scale. By so doing, he not only satisfied the plantation ideal of self-sufficiency and avoided the costs both of transportation, idle machinery, and labor for want of a spare part, but also enjoyed a growing market for his excess supply among a growing population of neighbors. In turn, when the market matured sufficiently, iron and iron tools could be manufactured

¹⁸ American State Papers. "Finance" (March 1789 - March 1815) Vol. II ser., 4 ed. by, Walter Lowrie Sec. of Senate, Washington, D.C. 1832

specifically for local trade. It was in this context that Cloverdale Ironworks in Botetourt County, Virginia, began.

Chapter II

CONSOLIDATING THE CLOVERDALE IRON LANDS, 1787-1810

References to the original founding of the Cloverdale Furnace are sketchy. According to Robert Stoner, the historian of Botetourt County, Robert Harvey began to develop this furnace in 1787.¹⁹ Although Stoner did not cite his authority, his life-long career as Clerk of the Court and unofficial historian add great credence to his conclusions. Certainly, on the 9th of August 1786 Robert Harvey did buy 400 acres near Tinker Creek in Botetourt County from Thomas Madison.²⁰

Robert Harvey began his interest in iron manufacture at an early age. It is impossible to pinpoint the origin of this interest; however, according to Andrew Miller, a great descendant of Robert Harvey, it began when he was between twelve and fourteen years old.

I remember my father telling me that when Robert Harvey was 12 or 14 he developed an intense interest in mechanical things. As the story goes, his mother discovered him playing hookey from school one day so that he could continue work on a small iron smelting furnace. I don't know how severe his punishment was, but it evidently did not

¹⁹ Robert Stoner. A Seed-Bed of the Republic: Botetourt County, Virginia. Kingston Kingston Press. 1962 p.269

²⁰ Botetourt County Deed Book # 3. p. 407.

deter his interest in making iron. When he realized manhood he built the first smelting furnace west of the Blue Ridge. It is my understanding that it was near Cloverdale.²¹

As an adult Robert Harvey lived on lands that his wife Martha Borden Hawkins Harvey had inherited from her father, Benjamin Borden, who in the 1720's and 1730's secured grants to about 30,000 acres joining the present-day counties of Rockbridge and Botetourt.²² Although he owned a store, two gristmills, and three ironworks, Harvey became interested in expanding his real estate holdings throughout the county.²³ Because Cloverdale furnace was located about twelve miles south of Harvey's Catawba lands it was possible that he entrusted its actual supervision to another. That this person would have been a partner rather than an overseer becomes a strong supposition, recognizing that Harvey would not have to lay out cash for services and in the process possibly obtain some additional capital.

Early iron smelting industries often were dependent on a partnership of owners. The most obvious reason for this was increased capital and limited risk. Building a furnace

²¹ Roanoke Valley Historical Society. vol.9, no.1 (1973-1974) Miller, Andrew. "Fighting Redskins not Redcoats; Revolution in Montane Virginia." pp. 14-21.

²² Kegley, B.F. Kegley's Virginia Frontier. Roanoke: Southwest Virginia Historical Society. 1938, Martha's first husband had been Benjamin Hawkins deceased.

²³ Stoner, Seed-Bed of the Republic pp. 274, 322

involved considerable expense. It was much easier for a group of men to make such a commitment than it would be for a single individual. A partnership would allow not only a larger capital pool and relative security, but also a wider variety of management and marketing experience. The possible exceptions to this rule were the very wealthy individuals who could afford to lose their investment without severe consequences.

The first of Harvey's partners was Jacob Coffman. On the 19th of August, 1790, Coffman bought 960 acres for £1,340 from Anthony Gholson on Tinker Creek adjoining lands Harvey had bought from Thomas Madison. At about the same time the Coffman family moved from Rockingham County to Botetourt.²⁴

Another member of this partnership appears to have been James Breckenridge (1763-1833). It is probable that his role in the initial development was minimal compared with the other partners. Although he eventually became the largest investor. Breckenridge had other landholdings in Botetourt, but the 784 acre tract adjacent to the lands of

²⁴ Rebecca & William Austin. Related Families of Botetourt County, Virginia. (Roanoke; Commonwealth Press. 1977) p. 113. This is suggested because his sons, who came with him, had wives from that county. See also, Katherine McNulty, "James Breckenridge" Unpublished Thesis, History Department, Virginia Polytechnic Institute and State University.

Coffman and Harvey was his home. This plantation was known as Cloverdale, given the name by the nine year old, James, in 1772.²⁵

Devoted to frontier agriculture, the Breckenridge family owned quite a bit of land. They had invested in the Loyal Land Company as well as other speculations in western lands associated with Colonel William Preston. Overall, the family was not wealthy but prosperous to be sure. Taxable property books indicate that in the mid 1780's James' widowed mother, Lettice Preston Breckenridge, possessed no white tithables, 7 slaves above the age of 16, 10 slaves below the age of 16, 10 horses, and 30 head of cattle. At the same time Robert Harvey possessed 2 white tithables, 6 slaves above 16, and 12 horses.²⁶ The small number of slaves owned by the Breckenridge and Harvey families does not indicate enough manpower available for constructing and operating even the smallest iron furnace when considering the regular demands, of plantation agriculture and upkeep. Similarly, Jacob Coffman appears to have owned too few slaves to do more than ordinary farming.

²⁵ F.B.Kegley. Kegley's Virginia Frontier. Roanoke; Southwest Virginia Historical Society. 1938, p. 511

²⁶ Personal Property Tax Books, Botetourt County 1784-1789 Virginia State Library Richmond Va. (hereinafter cited as ViSL.)

To provide the additional capital needed, the Harvey syndicate recruited a fourth partner, Samuel Adams of Richmond. The son of Richard Adams and his wife Elizabeth Griffin, he belonged to one of the oldest and most prosperous families in the capital of Virginia, owning quite a lot of property on Church Hill. Samuel Adams, 1776 - 1821, ran a store on Main Street in Richmond between 1783 and 1800. It is not clear what type of store this was, but he may have dealt in hardware. It is interesting to note that his brother, Dr. John Adams, as well as being a physician, also owned a store. The latter also enjoyed political prominence, first as a member of the Virginia House of Delegates (1803-1804), and then as Mayor of Richmond (1819-1825.)²⁷ On several occasions, both John and Samuel Adams were included in deeds in Botetourt County.

As an absentee land owner, Samuel Adams owned 200 acres on Tinker Creek as early as 1788.²⁸ The acreage was not extensive and the value was not high, and whether the two Richmond merchants intentionally set out to speculate in Botetourt County iron land, or whether they were drawn into it after acquiring this property, can only be conjecture. A

²⁷ Harry Ward & Harold Creek. Richmond During the Revolution. Charlottesville; University Press of Virginia, 1977 pp. 19, 113

²⁸ Botetourt County Land Tax Book 1788. Botetourt County Records, Fincastle, Va. 'Microfilm'

deed dated August 10th, 1803, suggests that perhaps the actual furnace stack stood on this land.²⁹

The essential support that Adams gave to the syndicate was capital and equipment. A list of taxable property held by Adams in Botetourt County for the year 1801, shows that he paid \$18.40 in taxes on 25 blacks, 6 horses, and one carriage with four wheels.³⁰ Although this was several years after the initial establishment of the furnace, it is not hard to suppose that these taxables were employed at the furnace.

As so frequently was the case involving frontier Virginia lands, there were multiple claims made on the titles for lands incorporated in the ironworks property. In what appears to have been friendly litigation designed to identify and secure boundaries, Robert Harvey, James Breckenridge, and Jacob Coffman contested the title to real estate adjoining the Cloverdale farm on the waters of the Tinker and Buffalo Creeks. There was no doubt that the property had originally belonged to Breckenridge, but it was not clear whether he had sold it to Robert Harvey and, if so, whether Harvey had sold it to Anthony Gholson, who in turn sold it to Jacob Coffman. It was Harvey who actually

²⁹ Botetourt County Deed Book # 8 p.236

³⁰ Botetourt county Personal Property Tax Book, 1801, ViSL.

brought suit and Gholson who was the defendant. Although Harvey appeared to win the suit, the court ordered him to divide the land with Coffman. Thereupon Harvey and Breckenridge cancelled their old contract and Harvey released his interest in the property to Breckenridge. On October 9, 1798, Coffman deeded his 82 acre portion of the property to Breckenridge³¹ Thus the syndicate eliminated Coffman and began to encourage the absentee investments of Adams rather than Harvey. At this point, Breckenridge's influence as the only resident investor gave him more control over day-to-day affairs when compared with Adams.

Between 1800 and 1803 Samuel Adams bought land from the others. This probably was not so much a decrease in expectation for ultimate profit potential as it was the transfer of an older man to a younger man of a long term investment. On November 3, 1800, Adams bought 187 acres from Robert Harvey for \$200.³² A year later, he paid Breckenridge £310 for 500 acres of what appears to have been ore or timber land not a part of the Cloverdale Farm³³

³¹ Botetourt County Deed Book # 6 p. 72

³² Botetourt County Deed Book #7 p.384.

³³ Botetourt County Deed Book #8 p.279.

By 1805-1806, James Breckenridge was paying taxes in Botetourt County on his Cloverdale farm of 650 acres as well as on an additional 73 acres "attached to same."³⁴ In 1806 the Cloverdale tract was reduced to 609 acres, minus the additional 73 acres.³⁵ This allowed for the sale of 114 acres, which Breckenridge made to Peter Randolph Beverley on March 25, 1806. Beverley paid taxes on the property in 1807, before selling it to his brother Carter Beverley of Culpeper County.³⁶

Peter Randolph Beverley was the fifth son of Robert Beverley of Blandfield, in Essex County. Upon the death of his father, he and his brother, Mckenzie, inherited jointly a 7,000 acre tract of land in Caroline County. Evidence suggests that Peter did not live on this land during his young adulthood. Indeed a great portion of his time was spent in Europe-- first in the Bordeaux region of France, where he unsuccessfully attempted a "mercantile venture," and then in Yorkshire, England, where he stayed with his brother William who was studying at Leeds. After his short stay Peter returned to Virginia with his wife.³⁷

³⁴ Botetourt County Land Tax Book 1805-1806.

³⁵ Ibid 1807.

³⁶ Botetourt County Deed Book #9 p.553.

³⁷ Virginia Magazine of History and Biography (herein cited as VMHB) XXI (1921) pp. 305, 332 "Beverley

Beverley owned 930 acres on the Catawba Creek, a branch of the James River which included the Brunswick Forge and Slitting Mill. In March of 1806, Samuel Adams also sold two parcels of land to Peter Randolph Beverley, for £600. The first tract contained 187 acres which adjoined lands of Thomas Preston on the Tinker Creek. This tract also adjoined lands which had been patented by Beverley as early as 1787. The second tract of land totalled 120 acres which adjoined lands of Christian Gish along Tinker Creek.³⁸

In addition to the sale of 114 In addition to the sale of 114 acres by Peter to his brother Carter, was the 930 acres the former had bought from Breckenridge and the 120 he had bought from Adams. Carter Beverley also bought two other tracts from Breckenridge, one containing between 600 and 700 acres which constituted much of the remaining Cloverdale Furnace lands.³⁹ It is not clear what happened to the 500 acres bought by Samuel Adams from Breckenridge in 1801; however, it was probably not part of the immediate furnace complex. The total effect of this myriad of transactions was that by 1803 Adams had sold to Carter Beverley for a substantial profit, all of his interest in

Family".

³⁸ Botetourt County Deed Book #10 p.68.

³⁹ Botetourt County Deed Book #9 p. 483.

the Cloverdale iron lands.

At this point, the question arises whether absentee ownership at Cloverdale had reached the potential for marketing its iron beyond the immediate locality. As long as the dominant administrative force was in the hands of the local partners-- Harvey, Coffman, and Breckenridge, the syndicate's operation was capable of reaching local marketing aims. When the Beverleys took over, it was possible that this sophisticated, Tidewater family would use their experience in trans-Atlantic enterprise to enlarge Cloverdale's market. However, later evidence suggests otherwise. Apparently, the Beverleys were either not willing to obligate enough capital to realize this extended potential, or else they could not afford it. Once they realized this, their speculative interests plummeted.

On the 25th of November, Peter Beverley sold his share of the furnace to his brother Carter for £5000.⁴⁰ This may have been a last chance effort by Carter to keep the industry and encourage its further development. Unfortunately, the amount of debt that Carter had achieved was too much to recover. In a letter to his elder brother Robert, Carter Beverley explained that he wished to extinguish his debt by selling between one-third and

⁴⁰ Botetourt County Deed Book #9 p.553.

one-half of his furnace property in Botetourt County for £177.33.0 pounds sterling.⁴¹ In 1808 he tried to accumulate debt payments owed Breckenridge by selling several slaves which were employed at another Beverley furnace in Rockbridge County.⁴² In the meanwhile, he paid taxes on all of his speculative lands--- 609 acres acquired "from Breckenridge," and 114 acres acquired from Peter Beverley as well as paying personal property taxes on slaves, and horses which were located at the Cloverdale Furnace, Cloverdale Farm, and Brunswick Forge.⁴³

Taking this situation and applying it to the general context of United States foreign and domestic problems during this period, a curious question arises. If Cloverdale Furnace was producing iron for trade purposes, this would have been a good time to own it. As table 1 illustrates, the Embargo and Non-Intercourse Acts of Congress between 1807 and 1810, inadvertently raised the price of domestic iron by forbidding exports with which to pay for iron importation.

⁴¹ Carter Beverley to Robert Beverley. 1807-1809. "letter", Beverley Family Papers, Virginia Historical Society,. (hereinafter cited as ViHi), mss2 b4674 al.

⁴² Botetourt County Deed Book #9 p.577

⁴³ Botetourt County Land Tax Book. 1782-1809

TABLE 1

Pig Iron Prices Per Ton, 1799-1820

1789	Price Per Ton	\$36.25
1800		\$35.25
1801		\$32.75
1802		\$30.75
1803		\$29.25
1804		\$29.75
1805		\$30.75
1806		\$35.75
1807		\$38.75
1808		\$40.00
1809		\$40.00
1810		\$38.00
1811		\$44.00
1812		\$47.50
1813		\$47.25
1814		\$46.00
1815		\$53.75
1816		\$50.25
1817		\$47.00
1818		\$42.25
1819		\$36.50
1820		\$35.00

Sources: Historical Statistics of the United States, Colonial Times to 1957. Bureau of Census: Department of U.S. Commerce, p.366

Why in a situation such as this did the Carters decide to get out of the buisness? The problem of finances must have run deeper than just dealings with Cloverdale. The overall picture suggests that too much speculation was endangering financial collapse. Finally, on May 23, 1810, Carter Beverley conveyed to John Tayloe III of Mount Airy, Richmond County, the title for the Cloverdale tract.⁴⁴

⁴⁴ Carter Beverley to John Tayloe III May 23, 1810. Tayloe Family Papers 1650-1970 ViHi Richmond Va. mssl t2118b 290-292.

Chapter III

AT CLOVERDALE, 1810-1828

The Tayloe family had long been associated with iron production in Virginia. Colonel John Tayloe I (1687-1747), was associated with several iron furnaces in the Tidewater area. Three of these furnaces were: the Bristol Iron Works in King George County (1721), the Occoquon Furnace in Prince William County (c.1750), and the Neabsco Iron Works also located in Prince William County (1738). In addition to being the controlling shareholder in these enterprises, Tayloe along with John Lomax acted as agent for British merchants who had invested in Virginia iron manufacturing.⁴⁵

One of the men he looked to for support in such a venture was Robert "King" Carter. Carter's involvement in the Baltimore Works led Colonel Tayloe to recognize the benefits that a partnership with such a wealthy and experienced man might bring to a new furnace. In a letter to Robert Carter, Colonel Tayloe urged his friend to "participate in another mining adventure."⁴⁶

⁴⁵ G. MacLaren Brydon, "The Bristol Iron Works in King Geroge County." The Virginia Magazine of History and Biography Vol. 42 (April 1934). pp. 96-97.

⁴⁶ Morton, Robert Carter of Nomini Hall. p. 19

Apparently, this letter was a designed to form a partnership for the Neabsco enterprise. As it turned out Colonel Carter, bought a large tract of land in Prince William County just a few miles from the Rappahannock River and on the Neabsco Creek where, in December of 1738, he and Tayloe built an iron furnace. The ore that they used came duty free from Maryland. Tayloe had gone to the colonial council as a formal agent for British iron merchants and persuaded them that this ore was necessary because of its high self-fluxing potential. The more self-fluxing the ore, the less limestone was needed to be added during blast.

When Colonel John Tayloe I died, his son John Tayloe II (1721-1779) inherited most of his estate including the Tayloe stake in the Neabsco Ironworks. During his life Colonel Tayloe II increased his family's wealth and was as enthusiastic an ironmonger as his father had been. There is no indication of the Carter family being involved in the Neabsco Company after John Tayloe II took over from his father. Few records remain that shed light on the industry during the Revolutionary War, but Neabsco thrived upon the war effort despite Colonel Tayloe's loyalist tendencies at the beginning of the conflict. When he died in 1779, he left a very large inheritance to his son John Tayloe III (1771-1828) which consisted of Mount Airy, several other

plantations, merchant vessels, slaves, race horses, and additional personal property including the interest in the Neabsco Ironworks.⁴⁷

John Tayloe III was eight years old when his father died. His guardian was Ralph Wormeley who was also his brother-in-law. In 1788- 1789, the youth attended Eton College in England. After the completion of his education, Tayloe conformed to his guardian's desire that he attend St. John's College, Cambridge, as a fellow commoner. In reply, Tayloe begged Wormeley to allow for his return to Virginia: "I have hereto flattered myself that at the age of eighteen I should be removed to a situation where useful and real knowledge is to be acquired, which can not be obtained here."⁴⁸

Finally in 1792, he returned to Virginia ready and willing to take up the buisnesses left him by his father. The same year of his return, John Tayloe III married Ann Ogle, the daughter of Benjamin Ogle of Maryland. He became a Federalist Senator for Virginia and served nine years.⁴⁹

⁴⁷ John Tayloe II Will 1721-1779. Richmond County Will Book, # 7 p. 354. ViHi.

⁴⁸ Etonia, March 1, 1912, p. 219 Tayloe Family Papers, ViHi. (This is an Eton College publication for the given date.)

⁴⁹ Ibid p. 219

The threat or fact of war with France, 1794-1801, and with Great Britian, 1807-1815, was reflected in John Tayloe III's military career. In 1794, he served in Western Pennsylvania to suppress the Whiskey Rebels as, Captain of Dragoons under General Henry Lee. In 1799, he at the height of the French war scare, he became a Major of the Light Dragoons, and in 1807 he was promoted to Colonel. When the incident pushed the Jefferson Administration to undertake modest defense measures, Colonel Tayloe was Commander of Cavalry forces in the District of Columbia.⁵⁰

John Tayloe and his wife Ann had fifteen children. The eldest, also named John, died before his father, (1793-1824). The second son was named Benjamin Ogle Tayloe (1796-1864), after his grandfather, the Governor of Maryland. The fifth son was George Plater Tayloe who was also the ninth child. Upon the death of his father, Cloverdale Furnace was passed on to George, who became the first of his family to live in Botetourt County.⁵¹ The 1830

⁵⁰ Randolph Tayloe. Tayloes and Allied Families. (Berryville Va. 1965.) p. 25 In addition to the wide range of activities so far described, Colonel Tayloe III was also very interested in horse racing. His stock included such famous racers as; Black Maria the Elder, Leviathan, Sir Archy, Gallatin, and Lady Lightfoot. The interest in this practice was far more than a hobby. It is evident in Tayloe's General Account Books that finacial support and benefits for these horses were as important as maintaining Mount Airy, his other plantations, slaves, merchant vessels, and ironworks.

Census returns for that county show that he owned 136 slaves which were no doubt associated with the furnace.⁵²

Apparently, Colonel John Tayloe III placed enough value on Cloverdale to make it the centerpiece of his bequest to his second surviving son.

In addition to the estates listed in appendix A and B, and the various furnace establishments, Colonel Tayloe owned property in the District of Columbia. On Lafayette Square he built the Octagon House whose unusual design pays tribute to a man willing to be different and undaunted by popular convention. In addition to the Octagon House, which was Colonel Tayloe's winter residence, he owned the Mansion Hotel, later named the Willard.⁵³

In consideration of the scope of John Tayloe III's personal and commercial interests, there is little doubt that his ironworks at Cloverdale could have been more capably managed than they were. If the furnace produced so little iron that the quantity was insufficient to market, he would have been able to absorb it directly into his various agricultural and merchantile ventures. If the furnace was producing enough to market outside of Botetourt County,

⁵¹ Ibid p. 26

⁵² Botetourt County Census, 1830. Newman Library, VPI&SU. 'Microfilm.'

⁵³ Tayloe, Tayloes and Allied Families. pp. 25-26

existing transportation and marketing capabilities associated with the Neabsco Ironworks would have aided Cloverdale in achieving these ends.

In the years following 1810, Colonel Tayloe bought other tracts of Botetourt County land, including the Brunswick Forge and Slitting Mill, and eventually the Martha Furnace.⁵⁴ It is most unlikely that these new lands were to provide for a new residence. The Tayloes resided in either the Octagon House or Mount Airy in Richmond. Rather the intentions were to work the furnace as they did Neabsco.

As absentee owners, one reason for purchasing this property was to relocate surplus slaves traditionally, with most large slave owners, Tayloe was constantly switching his slaves from farm to farm, and from industry to industry. Because he was one of the largest slave holders in the state and the largest in Richmond County, he had several relocation possibilities. In 1809, he owned nine plantations with a total of 385 slaves. As the population increased there was a need to relocate. In this case, the reason for buying Cloverdale was not simply to increase industrial assets, but rather to absorb overflow in slave population. For a prudent investor like John Tayloe III, potential growth was a valuable consideration, but if a

⁵⁴ Botetourt County Deed Book, #12 p.19.

property was worth keeping, it had to produce.

Another motive for the purchase was the potential for vertical integration. United with his grandfather's Neabsco works and that at Cloverdale, John Tayloe III could follow the industrial product from the raw source to the market. Cloverdale, Martha Furnace, and Neabsco were able to produce the pig iron, while the Brunswick Forge and Slitting Mill provided the bar iron. The ore and lime deposits that lay nearby each of the furnace developments supplied the raw materials as did the local timber supply the charcoal. The only aspect of the industry that caused any problem at all appears to have been transportation of the final product.

Early roads in the area were well established by the 1800's. In 1786 the Botetourt County court ordered that a road be built from the town of Fincastle to the Brunswick Forge. The following year it was extended so as to join a major trade route across Tinker Creek, thus traversing Botetourt and the Back Creek. This was the "Great Road" between the Potomac and the Carolinas. It intersected the highway which led from Richmond west at what is now Roanoke. Although these roads were very primitive, they did provide limited means for wagon transport of iron and iron commodities. However, one wagon could carry only a small amount of iron at a time. If the market lay east, near

Washington or Richmond, the price of transportation would have been high, thus decreasing profit.⁵⁵

An alternative to wagon transportation was by way of water. Before canal days on the James, cargo could be collected at Buchanan and sent down the river on rafts during high water. Once it reached deeper water, such as that around Bent Creek in the present county of Buckingham, the cargo could be shifted to batteaux and keel boats for the remainder of the journey to Richmond. From there Colonel Tayloe could either sell the iron on the spot or transfer it to one of his own schooners connecting with the Atlantic market via Baltimore.⁵⁶

As a general rule, individual iron furnaces were only of local importance. The Cloverdale Furnace was no exception. Indeed, its impact on the towns and villages of Botetourt and adjacent counties was not sufficient to warrant extensive documentation. It was only after the

⁵⁵ Stoner, Seed-Bed of the Republic. pp. 152f, 161, 260, 412

⁵⁶ Cloverdale Furnace General Account Book 1811. Tayloe Family Papers, 1650-1970 p. 202 ViHi. Batteaux (or Bateau) boats were a mainstay in transportation during the 19th Century. They were approximately 60 feet long by eight feet wide with a flat bottom and upturned ends. In the front there was a flat platform on which the main pilot could navigate with the use of a pole. On the stern was a long tiller used by a second boatman to steer the end and provide partial locomotion. When carrying iron the cargo was neatly stacked in the center of the boat producing a sluggish but stable effect.

repercussions of the Napoleonic Wars had hit that this small furnace in transmontane Virginia began to prosper. The American Embargo Act of 1807 and its successor, the Non-Intercourse Act of 1809, were enacted in the effort to preserve an honorable neutrality by avoiding international incidents on the high seas; but one of their effects was to give American manufactures a much greater share of their own domestic market; a situation which lasted until the end of the War of 1812. Cloverdale shared in this prosperity.

Personal property tax records for Carter Beverley's Cloverdale Furnace in the year 1809, show a work force of: 20 blacks over the age of 16, 2 blacks over the age of 12, and 8 horses. For the same year, his Cloverdale Farm had an inventory of: 13 blacks over the age of 16, 2 blacks over the age of 12, and 13 horses.⁵⁷ This seems to indicate that the 600 acre farm, whose production was devoted primarily to sustaining its own and the furnace's labor force, required 15 blacks, while the furnace employed 22. Clearly the Cloverdale complex had become a substantial enterprise in less than four years from its commencement.

Throughout the history of Cloverdale the number and distribution of horses was appropriate to the furnace's size. "Other than slaves, Wagons, and very special items,

⁵⁷ Carter Beverley Personal Property Tax 1809 Personal Property Tax Book 1809. ViSL.

the most valuable individual item of personal property was the horse." In 1790, The average work horse sold for approximately \$30 in Botetourt County.⁵⁸ The price of mules shows an escalation by 1812. Cloverdale purchased two mules in that year, for \$81.25 per animal. Naturally, the price increase was not restricted to mules; work horses undoubtedly were affected as well.⁵⁹ The eight horses employed at the Cloverdale Furnace in 1809 were used to haul charcoal, ore, and limestone flux. They were probably involved in transportation as well. The purchase of two mules in 1812 by Colonel Tayloe was a prudent move in light of his extension plans. More slaves, more land and more animal power can only point to the interest of increased returns.

Early iron manufacture at Cloverdale, and elsewhere in Southwest Virginia was primarily dependent on slave labor. Of course land was needed for resources and animals for torque, but without slave labor few of the developing furnaces would have reached a state above that of meeting the local and plantation needs. To hire a free work force for an enterprise as modest as Cloverdale, would entail

⁵⁸ Mary Kegley. A Study of wills and appraisals of Southwest Virginia. Thesis submitted to Graduate Faculty of Radford College, Newman Library, VPI&SU, p. 39

⁵⁹ General Accounts Cloverdale Furnace, 1811-1827.

expenses far above what profits would allow. Generally, in the United States, iron manufacture did not provide profitable employment. The common free furnace laborer lived a modest life at best. What money they made was quickly spent at the company store. In 1805 and 1807, woodcutters at Hopewell Furnace in Southeastern Pennsylvania were paid between 35 and 45 cents per cord of wood, while miners received between 50 and 75 cents per day.⁶⁰ In many ways the free iron workers of the north received no greater reward for their work than did the slaves in the south--- room and board.

When describing slave life at Cloverdale, some of the fundamental ideas and practices which were not accounted for in the Tayloe records, can be inferred by comparing Cloverdale with David Ross' Oxford Furnace sixty miles east in Bedford County. According to Professor Charles Dew, all workers at the Oxford Furnace were black slaves, except for one white overseer. When the overseer was absent a slave named Abraham acted in his stead. This not only illustrates the extent to which slave leaders were trusted, but also that they were highly skilled and versed in both the technological and administrative details involved in the

⁶⁰ Joseph Walker, Hopewell Village. (Philadelphia; University of Pennsylvania, Press.) 1967, p. 261

iron industry.⁶¹ Although it might have been possible for an absentee furnace owner to simply finance the industry and let his slaves run it, at Cloverdale between 1810 and 1820, Colonel Tayloe employed at least three white men to fill the administrative positions of clerk, overseer, and manager.⁶²

Customarily, in slave society, parents taught their children the necessary skills of each occupation. At the Oxford Furnace, colliers would teach their children the art of making charcoal. In turn, these children would teach their children and so on through generations. This also was exemplified in the mining and woodcutting families.⁶³ Peter Beverley found an alternative to this traditional method of training slaves. In 1806 he bought some slaves from another Beverley furnace in Rockbridge County and brought them to Cloverdale.⁶⁴ John Tayloe III also imported some skilled slaves, probably from Neabsco. When there was need for additional workers, with or without specific skills, he simply transferred the requisite male and female slaves from one of his other plantations to Cloverdale, utilizing a

⁶¹ Dew, "David Ross and the Oxford Iron Works," WMQ, 3rd ser., XXXI (April 1974).

⁶² Botetourt County Census Returns, 1810-1820. Newman Library, VPI&SU 'Microfilm.'

⁶³ Dew, "David Ross and the Oxford Iron Works," WMQ, 3rd ser., XXXI (April 1974).

⁶⁴ Botetourt County Deed Book #9 p.577.

foreman to supervise the party as it walked to Botetourt. On the Cloverdale General Accounts ledger, the clerk made a note of just such an event. Thus, on December 15, 1810, Cloverdale paid £52.3.10 to "Fogg for going out with negroes."⁶⁵

There also were indications that John Tayloe III bought slaves already in the county. On May 18, 1811, Cloverdale was charged "\$1871.00 for 2 negroes."⁶⁶ It is not clear if these two slaves were skilled or unskilled; however, as suggested by the high prices, they were probably strong healthy males capable of extreme physical labor.

The division of labor at Cloverdale was based on ability. Heavy jobs were usually left to the men, while the women were responsible for chores. Children were not usually employed until after the age of fourteen. In some instances David Ross made exceptions. He set women to work in the ore mines and children hauling wood as a means of punishment.⁶⁷

The fragmentary Cloverdale records makes it impossible to describe the division of labor, but general patterns of slave life may be inferred from Richard Dunn's study of

⁶⁵ Cloverdale General Accounts, 1810 p. 204. ViHi.

⁶⁶ Ibid 1811-1827 p. 23 ViHi.

⁶⁷ Dew, "David Ross and the Oxford Iron Works" WMO, 3rd ser., XXXI (April 1974) pp. 197-198.

Mount Airy, (WMQ 3rd ser., XXXIV January, 1977.)

Apparently, Colonel Tayloe was a conscientious master and showed serious concern for the well being of his slaves. Artisans at Mount Airy worked at such a leisurely pace that three masons took fifteen working days to build a cottage chimney, and thirty working hands at the Old House Plantation took eight weeks to sow 258 bushels of wheat. Tayloe required his slaves to work six days a week, giving them several vacations in addition to nine days off at Christmas.⁶⁸

By late December, the slaves were shifted from iron making to maintaining the furnace equipment. Usually, during the winter months, the furnace closed down to avoid the possibility of a frozen waterwheel and solidified iron in the stack. During this off season, carpenters and jointers repaired old equipment, while also making new tools for the next year. While colliers made their baskets and coaling instruments, common laborers probably were diverted from furnace to farm chores. Although Colonel Tayloe did not demand exclusive work of his slaves at any one time, the work was unremitting.

⁶⁸ Dunn, "A Tale of Two Plantations" WMQ, 3rd ser., XXXIV Jan, 1977 p. 57.

At the Oxford Furnace, David Ross paid his slaves for overtime work, in some cases, they bought their freedom. It is unlikely that Colonel Tayloe followed Ross's example. Between the years 1811 and 1814 he sent at least thirty-nine slaves to Cloverdale from his Rappahannock farms. Most, but not all were allowed to stay where they were. Even though Colonel Tayloe was accustomed to relocating slaves from one farm to another, he tried to keep families together.⁶⁹

The basic demographic aspects of slave life at Cloverdale were fair to good. Colonel Tayloe certainly was good to the slaves with whom he had immediate contact, and there is no reason to believe that those slaves in distant Botetourt did not get the same respect. The Tayloe Account Book indicates that there was only one runaway attempt.⁷⁰ Had the conditions been worse, the number, no doubt, would have been higher.

In general, slaves were quite abundant throughout Botetourt County. The census of 1820 shows that there were 1359 male slaves, 1313 female slaves, 145 free black males, and 145 free black females. This appears to be a healthy number of potential labor. The 1810 census returns for John Tayloe III's furnace and farm enterprises in Botetourt, show

⁶⁹ Ibid p. 43

⁷⁰ John Tayloe III, General Account Book 1805, p. 169 ViHi.

a total of 153 slaves divided among three different employees in charge of the day-to-day execution of Tayloe's policies: P. Gordon as clerk of both the furnace and farm, Sam English as overseer, and Thomas Evans as manager.⁷¹

Colonel Tayloe's Account Books reveal that his iron venture was a complex operation, requiring intricate book keeping and displaying a conscious desire to achieve cost-effectiveness. Not only did he replenish the supply of slaves left by Beverley, but he expanded the industry. An illustration of this is reflected in the purchase of a new wagon and team of horses. On August 9, 1810 Cloverdale paid £120 "To general charges, for a wagon and 5 horses," a total of \$400. Again, in February of 1812, the furnace purchased two mules from "Smith" for a sum of \$162.50.⁷² Besides such equipment, the furnace account was charged £9 for office supplies and ledgers which unfortunately, have not survived. Tayloe required periodic comparisons of these complete records kept at the furnace, with his General Account Books kept at Mount Airy and in Washington.

The problems of absentee ownership were such as to discourage the underfinanced from aspiring to become an iron rich. The profitability as well as day-to-day management of

⁷¹ Botetourt County Census, 1820. Evans recieved a payment of L300 on June 22 for services rendered.

⁷² Cloverdale General Account Book 1810. ViHi.

a furnace depends on the manager. In Cloverdale's case, Thomas Evans was given a free rein with which to accomplish his responsibilities. Customarily, such a manager was responsible for all transactions of ore, charcoal, limestone, and outgoing sales. During the winter months he was in charge of closing down the furnace and keeping it from freezing. If solidification occurred, it was the manager's responsibility to renovate it.

By the middle of the nineteenth century, the duties and responsibilities of the furnace manager had become separate from the functions of the ironmaster. The ironmaster was a technician while the manager was a businessman. The manager dealt with administration and the ironmaster was in charge of the iron production. Cloverdale was relatively sophisticated in its other business methods, and it is probable that Evans, as the industrial manager and planner, paid H. Caldwell, £31.10.0 per quarter for his services as iron master.⁷³

Iron making involved a complex technology. Before and after Cloverdale's first period, 1789-1814, the owners of some furnaces imported ironmasters from Europe where, especially in Germany, the skill had become an art. This was not necessary at Cloverdale, because the Tayloes could

⁷³ Ibid. 1810.

draw on the skilled labor pool at Neabsco which had been built up in the course of three-quarters of a century of operation. As for the rest of the jobs associated with producing iron, they were classic examples of menial labor: mining ore, hauling the materials from station to station, felling trees, and preparing billets for charring into charcoal. Although David Ross, at the Oxford Ironworks set children to work, it is unlikely that the Tayloes did. Practices at Mount Airy indicate that children were set to more traditional and simple tasks; this was probably the case at Cloverdale as well.

Like Oxford, Cloverdale Furnace was operated entirely by slave labor with the exception of the three administrators. Most of the work was menial and demanded little skill. With proper incentive Colonel Tayloe was able to produce superior results from his slaves. Perhaps this motivation lay in the privileges given them. Part of Tayloe's overall philosophy was to make each of his estates self-sufficient. Slaves were allowed to own a few animals, to grow a few crops and to enjoy a somewhat relaxed life style⁷⁴ Dunn comments that, "...living conditions at his Rappahannock estates must have been exceptionally relaxed,

⁷⁴ us | Dew, "David Ross and the Oxford Iron Works" |WMQ|, 3rd ser., XXXIV (Jan. 1977), 53.

for Tayloe was no profit-maximizing entrepreneur."⁷⁵

As far as surviving records can demonstrate, the merchandizing of Cloverdale's pig and bar iron was not entrusted to the Cloverdale staff. Colonel Tayloe may have acted as his own contact with potential buyers. However, it is more likely that his Neabsco Company absorbed most of Cloverdale's production and resold or reworked it. Regardless of the actual salesmen, Cloverdale iron did supply plantations along the James River, between the Blue Ridge and Richmond as did David Ross with Oxford iron.⁷⁶

Although Colonel Tayloe apparently did not entrust his Cloverdale staff with the duties of iron sales, there were three men from Richmond whom he consulted: Samuel Adams, Robert Gamble, and a certain A. McCall. Adams, it has been seen, was a wealthy Richmond merchant both during and after his involvement in the furnace. His connections would certainly have been a valuable asset. Likewise, Robert Gamble was also a wealthy merchant from Richmond. In a letter written in 1804, between Gamble and a planter by the name of Thomas Massie, it becomes clear that Gamble was an agent for English buyers, storing the merchandise in one of

⁷⁵ Ibid, p. 64.

⁷⁶ Dew. "David Ross and the Oxford Iron Works." WMQ. 3rd ser., XXXI (April 1974).

three storagehouses which he had built in Richmond.⁷⁷

In a letter to James Breckenridge from Robert Gamble, Gamble complains that McCall had sold some iron which was "not quite malable."⁷⁸ In light of this letter, it becomes apparent that Breckenridge never completely severed his connection with the Cloverdale industry. In the first place, he extended to John Tayloe III the same credit towards the purchase of the furnace that he had Carter Beverley. Doubtless James Breckenridge was also free with advice for the absentee owner and Cloverdale staff. As a close friend of Tayloe, Breckenridge could act in his stead in the event of an emergency.

Another factor which encouraged James Breckenridge to maintain an interest in Cloverdale after it was sold to Colonel Tayloe, was the considerable amount of trade that the furnace provided. Breckenridge owned large amounts of land around Cloverdale of which some may have produced ore, limestone, or timber. Wood was always in demand at a charcoal fueled furnace.⁷⁹ However, if it was not resources

⁷⁷ Robert McColley, Slavery in Jeffersonian Virginia. Chicago; University of Illinois Press., 1964, 1973. pp.14-15.

⁷⁸ Robert Gamble to James Breckenridge. Letter July 2, 1810. Breckenridge Papers, ViHi. Microfilm.

⁷⁹ In some cases the furnace consumed two acres of wood in one day, a rate which required more than 500 acres per year.

for the furnace that kept Breckenridge on the payrole, than it may have been to provide foodstuffs. Even though the establishment had its own farm, it may have been necessary to purchase additional commodities. One such instance is reflected on Colonel Tayloe's daybook for the years 1811-1868, wherein was noted that on Tuesday June 9, 1812, the furnace bought from James Breckeridge, \$207 worth of beef.⁸⁰

Of course the furnace bought supplies which the farm could not produce. In June of 1811, Cloverdale paid to the Georgetown Commission merchant Charles Nourse, \$108.72 for white sugar, \$85.10 for dark sugar, \$76.00 for a tierce of coffee and \$44.85 for a chest of "Hyson thin tea"--- a total of \$315.17. Although the aim of an iron plantation was self-sufficiency, there was no way to meet this idea totally. In addition to the certain food stuffs which were brought in, Cloverdale was obliged to import various cut and forged implements, ie. nails, chains, and horse shoes as well as clothing, shoes, and office supplies. The fact that these articles were not produced at Cloverdale is not an indication that it could not done, but rather, a matter of cost efficiency. The manufacture of nails and other cut implements would have hampered the production of the more

⁸⁰ John Tayloe III Day Book, 1811-1868. Tayloe family Papers 1650-1970. ViHi.

marketable pig iron. Furthermore, it would have required the purchase of additional complex machinery.

On September 22, 1810, the furnace recieved £15.13.3 "by smith's work for bar iron." Again on August 8, 1811, "by smith's work for 3 tons of bar iron' at approximately £90.06.0.⁸¹ This indicates that Tayloe was selling bar iron for about £30 per ton. As indicated in table 1, the price for pig iron in 1810 and 1811 was between \$38.00 and \$44.00 on the domestic market. For bar iron, the price was between \$5 and \$15 more expensive pig iron. The Atlantic Market was doing much better. There one could get \$110 to \$120 per ton for bar iron.⁸²

In 1810, Secretary of the Treasury Gallatin, reported to Congress that the value of iron manufactured in the United States was estimated at between \$15,000,000 and \$20,000,000. He related that 153 furnaces made 53,908 tons of pig iron and that 330 forges made 24,541 tons of bar iron. However, regardless of the healthy nature of the U.S. iron industry, its market was slow. Of course the demand increased dramatically during the War of 1812. Continuation of the 25% war tariff raised the price even higher to a peak of \$53.75 per ton of pig in the early months of 1815.

⁸¹ Cloverdale General Account Book 1810. p. 204 ViHi

⁸² French, B. Iron Trade of the United State: 1621-1857. (Clifton; Augustus M. Kelly pub.,) p. 18

Unfortunately, this proved to be inadequate tariff protection for the resumption of peacetime foreign trade. Between 1815 and 1820 many ironworks depressed both domestic and foreign prices for bar and pig iron.⁸³ This; however, did not directly hurt Cloverdale. The combined estate of Colonel Tayloe was self-sufficient enough and his cash reserves great enough to enable him to survive the depression. While many people were barely avoiding bankruptcy, Tayloe was buying more property such as the Martha Furnace owned by Robert Harvey.⁸⁴ He continued to build up his industrial enterprises in Botetourt County until his death in 1828 when his son George Plater Tayloe moved to the county and took personal control of the Cloverdale Furnace.

⁸³ Ibid. p. 204

⁸⁴ Botetourt County Deed Book, #12 p.343.

Chapter IV

THE DECLINE OF CLOVERDALE 1 IN A DECADE OF GREAT CHANGE

Small though it was, Cloverdale Furnace reflected the increasing national character of the United States economy in the Jacksonian Era. As the effects of the Panic of 1819 dissipated around 1828, the iron works enjoyed a prosperous year. In that year George Plater Tayloe became its owner and supplied the furnace with increased capital and personal attention. It was also in that year that President John Quincy Adams signed into law the so-called Tariff of Abominations which gave immediate high tariff protection against foreign iron products and implied a continuance of that policy.

When Andrew Jackson became President in 1829, he recognized the need for national economic growth as a whole and spoke in the language of the National Republicans. But in dealing with the tariff question he tended to avoid direct commitment by speaking of it in generalities. In his first address to Congress on December 8, 1829, Old Hickory made it clear that "...he stood only for the most cautious steps toward tariff reduction."⁸⁵

⁸⁵ G.G. Van Deusen, The Jacksonian Era, 1828-1848 New York; Harper and Row., 1959 p.38

It has been said the the Tariff of Abominations was a confused and contradictory measure, more political and regional in its motivation and effects than purely economic. Paradoxically, the tariff issue was such a melange of regional views that neither the Democrats nor the emerging Whigs could take a very clear stand on it.

Even with his initial inaction, Jackson recognized that there were dangerous internal problems arising from the 1828 tariff. Throughout the 1820's duties on almost all imported goods had risen steadily, peaking in 1828 at between forty to one-hundred percent.⁸⁶ Many Southerners saw this increase as an attack on their social and economic stability by Northern entrepreneurs. John C. Calhoun was particularly vocal on this issue. He saw extreme tariff protection as a biased endeavor which made Southerners " the serfs of the system, out of who's labor is raised, not only the money paid into the Treasury, but the funds out of which are drawn rich rewards of the manufacture and his associates in interest. Their encouragement is our discouragement."⁸⁷

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The Great Tariff Debates, 1820-1830 ed. Geroge R. Taylor. F.W. Taussig, "Protection to Young Industries." Boston: D.C. Heath and Company., 1959. p.89

⁸⁷ G.G. Van Deusen. The Jacksonian Era, 1828-1848. p.39

An attempt was made to settle the issue in 1832 with the passage of a new tariff law. Despite the attempts of Henry Clay and John Q. Adams to maintain selected, specific duties, the schedule was adjusted to fifty percent ad valorem on most items.⁸⁸

In a short time this ad valorem duty also proved to be deficient and capable of undervaluation and fraud. Therefore, in 1833 another tariff law was passed. This new tariff, commonly referred to as the Compromise Tariff, was a bipartisan measure designed by both parties to remove the subject from self-destructive debate. It provided for a gradual and steady reduction of duties until July of 1842 when it would stabilize at a universal twenty percent.⁸⁹

In the theater of national politics, the Compromise Tariff succeeded brilliantly. For the moment, flames of secession and Civil War died down, leaving only smoldering embers as a remote threat to security of the Union. In the more specific case of the United States iron industry, success was not as forthcoming. Although the tariff protection of the 1820's and 1830's had allowed substantial protection for pig, bar and forged iron, it did not protect

⁸⁸ Frank W. Taussig, The Tariff History of the United States. New York: G.P. Putnam's Sons., 1923. p.105 ; see also Taylor ed. The Great Tariff Debate, 1820-1830. p.89.

⁸⁹ Ibid p.100

the heart of the industry as shown in Table 2

TABLE 2
Duties on Iron 1816 - 1842

	Pig	Hammered	Rolled
1816 lbs.	20% ad valorem	.45 per 100 lbs.	\$1.50 per 100
1818	.50 per 100 lbs.	.75 "	\$1.50 "
1824	_____	.90 "	\$1.50 "
1828	.62 1/2 "	\$1.12 "	\$37 per ton
1832 lbs.	_____	.90 "	\$1.50 per 100
1842	20%	20%	20%

Source: Frank W. Taussig, The Tariff History of the United States.
New York: G.P. Putnam's Sons, . 1923 p.50f

Pig, bar and forged iron manufacturers were well established by the 1820's and 30's both in foreign and domestic marketing and in industrial techniques. Their prosperity fluctuated but not to extremes. The real upset began on July 4, 1828, when the Maryland Legislature granted a charter for the construction of the Baltimore and Ohio Railroad, giving the greatest stimulus for the manufacture of metals in the history of the United States.⁹⁰ At no time in the history of the United States had there been such a stimulus directed at the manufacturing of metals. As local railroads grew to be national ones, they could not help but cause great growth in the iron industry. However, there was no guarantee that the railroads would restrict their demand for iron or rolling stock to that made in America. The nature of free enterprise is fickle as to national markets and cost efficiency so crucial a factor as to jeopardize patriotism.

It is generally accepted that the spirit of the Jacksonian Era was one of free enterprise. Whether the President in his veto of the Maysville Road Bill, or whether

⁹⁰ James M. Swank, The History of Iron in all Ages: and Particularly in the United States and Colonial Times to 1891. Philadelphia 1892. reprint by Burt Franklin, New York., p.427f

Chief Justice Story in his decision on the Charles River Bridge case intended to lend explicit comfort and support to both free enterprise and free trade may be debateable, but it is a fact that iron from abroad became increasingly competitive with domestic iron during this period.⁹¹

Not only were American iron makers unprotected, but the transition between high protection in 1828 and little or no protection in 1835-36 was abrupt. Even if they were shrewd economic planners, they could not adjust their labor, supply of raw materials and inventory quickly enough to minimize losses.⁹²

In 1833 United States railroad operators recognized that English rails were superior in quality and cheaper than those milled in America. As a consequence they began to rely heavily on these foreign rails thus disallowing any domestic competition. Enhancement for this trend came not only from the Compromise Tariff and reduced import duties, but also from the elimination of railroad iron duties altogether.⁹³ In a choice between nurturing the Country's

⁹¹ Van Deusen, The Jacksonian Era: 1828-1848. p.52 see also, Documents of American History Henry S. Commager ed., New York; Appleton-Century-Croft Inc., 1949 p.253f

⁹² Fawn M. Brodie, Thaddeus Stevens: the Scourge of the South. New York; Norton and Company., 1959 p.131 This low tariff situation was reflected in the 1850's and sparked the great Pennsylvania iron paralysis.

floundering iron industry and establishing immediate State and Interstate transportation capabilities, both regional and National leaders agreed. The railroad was the future. Justification for purchasing European rails was both cost efficient and practical. It would be several years before America's iron manufacturers would be able to produce a similar quality rail, and railroadmen did not want to wait. Legislation was passed with such considerations in mind.

That the South was not unified in opposition to protective tariffs was demonstrated in numerous ways, particularly in Virginia. During the 1830's and 1840's, the Old Dominion had come to an economic and political cross-roads. After the measured and gentle peace of the Era of Good Feelings, Virginians were resistive to Jacksonian Politics. Many of the state's leaders were alienated from Jackson and thus joined the opposition Whig Party as indicated by Table 3

In spite of such political reorientation other political leaders accommodated the new age such as Senators: William C. Rivers, Richard E. Parker and William Roane.

⁹³ Hazard's United States Commercial and Statistical Register, Containing Documents, Facts, and other Usefull Information. Ed. Samuel Hazard., Vol II January 1840 - July 1840. Philadelphia; William Geddes, 1840, p.106
VPI&SU Newman Library, Special Collections.

TABLE 3

Governors of Virginia 1830 - 1840

William Branch Giles	Democrat	1827 - 1830
John Floyd	Whig	1830 - 1834
Littleton Waller Tazewell	Whig	1834 - 1836
Wydnham Robertson	Whig	1836 - 1837
David Campbell	Whig	1837 - 1840
Thomas Walker Gilmer	Whig	1840 - 1841

Source: Earl G. Swem & John Williams (eds.), A Register of the General Assembly of Virginia, 1776-1818, and of Constitutional Conventions (Richmond, 1918),

Whatever the cause, the politics and economics of Virginia languished during the Jacksonian Age. In a national trend, Virginia and Maryland entrepreneurs living in the big Eastern cities, became so concerned with the future of manufacturing and transportation facilities that they saw themselves as equals to the "manufacturers and colliers in the great industrial states of Pennsylvania, New York and Massachusetts."⁹⁴ They sought legislative permission to extend their railroad lines across state boundaries and to penetrate out-of-state markets. Baltimoreans exemplified this with their desire to franchise the Baltimore and Ohio Railroad's passage through the Old Dominion. The Virginia counterparts emerged later and were less effective due to continued canal mania.⁹⁵

When reflecting on specific Virginia families it is clear that there was an industrial vs agrarian balance in many of the the large and wealthy planter families. People such as the Carters, Spotswoods, Washingtons, Jeffersons, Beverleys and Tayloes had all maintained a planter's image while owning and operating various industrial enterprises, including iron works. The situation which sets off these

⁹⁴ Bruce, Virginia Iron Manufacture in a Slave Era. p.259f

⁹⁵ W.E. Hemphill, Sadie E. Engelberg, and Marvin W. Schlegel Cavalier Commonwealth: History and Government of Virginia. New York; McGraw-Hill., p.214f

earlier trends from the movement of the 1830's and 40's was one of degree. Southern manufacturers became alarmed over the momentous expansion made by their Northern counterparts in canals, roads and railroads. For the progressive manufacturers of Virginia, the time had come for aligning their priorities. If their businesses were to grow as expected, they would have to create an accommodating environment.

The furnacemen from the Valley of Virginia began this process by demanding and obtaining the incorporation of the first two transmontane banks in Virginia between 1816 and 1818.⁹⁶ Decreasing tariffs after 1833 affected the ironmongers adversely because the industry had not quite reached a stable supply-demand relationship on the domestic front.

As prices began to slacken during the 1830's, iron manufacturers became increasingly restive. On June 15, 1841, an assembly of iron makers met at Lexington to discuss their deepening distress.⁹⁷ Although nothing specific came of this meeting, it shows an economic awareness at the same time that the Old Dominion came closest to electing a Whig President. Virginia's Whig Senators and Congressmen helped

⁹⁶ Hemphill, Engelberg and Schlegel. Cavalier Commonwealth: History and Government of Virginia. p.213

⁹⁷ Bruce. Virginia Iron Manufacture in a Slave Era. p.264

restore the tariff to its status in 1832.

In order to compete with larger manufactures situated in the East---especially Baltimore and Pennsylvania---Virginia's tTransmontane manufactureries depended upon providing a transportation link between the Ohio Valley and the Virginia coast. In this way, the Old Dominion could share in the growth of new western lands as New York was doing and as Pennsylvania and Maryland hoped to do. At the time, Virginia's program of state internal improvements was in step with that of the nation. This system was so comprehensive that it included feeder canals such as plans for the Botetourt extention which would join the James River and Kanawha Canal. That great state enterprise reached westward from Richmond to Lynchburg by 1846. Either continuation of the canal to Buchanan just west of the Blue Ridge, or construction of a railroad to the navigable portion of the Kanawha at Charleston were both possibilities in 1847.⁹⁸ As it turned out the state Legislature opted for a canal which eventually reached Buchanan.

By the early 1840's, Virginia iron industries along with those nationwide, again reached a stable state for reasons mainly independent of the previous tariff controversies. Traditionally, increased production of iron

⁹⁸ Ibid p.271

had been the result of increased demand and sparked the construction of new furnaces. By the second quarter of the 1800's, this basic supply-demand relationship was compounded by the shift in America's economy. No longer was it productive to operate plantation furnaces simply for the benefit of local and plantation markets. As early as the 1830's the chief goal of iron makers had become access to a larger market in terms of both area and quantity. As a result the small marginal furnaces were either abandoned or consolidated.

In Virginia nowhere was expansion and consolidation more exemplified than by the Tredegar Iron Works in Richmond. Picking a central location convenient for both foreign, coastwise, and domestic trade, Francis B. Deane was able to utilize the production of rural furnaces throughout the Mid-Atlantic. The outlying furnaces produced the pig and Tredegar refined it for the specialized products and markets. Deane began this enterprise in 1836 by building a large rolling mill, an extensive foundry and machine shop, and a large factory for the production of railway cars.⁹⁹

⁹⁹ Swank, The History of the Manufacture of Iron in all Ages. p.270.

George P. Tayloe's Cloverdale Furnace quickly became a supplier of pig iron for the Tredegar Works. Prior to 1828, any Cloverdale iron castings that were not sold out-right had been absorbed by the Tayloe Empire to be used on the various plantations. Now that Cloverdale and Mount Airy were no longer controlled by the same individual, this convenient way of dealing with surplus goods without cutting prices, came to an end.

In hope of finding security by establishing new markets in the Northeast, George Tayloe sought and obtained at least two connections in New York State between the years, 1831 and 1832. The first of these was a certain James Kelso. In reply to Tayloe's inquiry, Kelso agreed to accept a consignment of Cloverdale Pig Iron to test on the local market. During the winter months when prices were high because of limited transportation and frozen waterwheels, Kelso suggested that \$40 per ton was a good introductory price. Hopefully, the experiment would win for Cloverdale, a reputation equal to that of the Harvey iron. Previous to Cloverdale's New York debute, Harvey iron from Catawba Furnace, was capable of demanding from \$6 to \$8 more per ton.¹⁰⁰

¹⁰⁰ James Kelso to George P. Tayloe Letter New York, November 29, 1831. Tayloe Family Papers, 1750-1970,.; H.M. McMurry to George Tayloe Letter., New York November 30, 1831. Tayloe Family Papers.

Ironically this letter sheds light on a characteristic of Cloverdale iron which was above all the deciding factor in the survival of the furnace. Harvey's iron was extremely popular because of its excellent strength and durability when used for cannon. Likewise, Kelso was giving Tayloe the chance to test his iron with the best. Although the outcome of this specific test is not known later tests performed throughout the 1840's, 50's and 60's proved it a match.

Tayloe made other attempts at entering the New York Pig Iron market. In a letter dated November 30, 1831. H.M. McMurry informs George Tayloe that he has sold four tons of Cloverdale pig at \$40 per ton. Unfortunately not all of the iron sold proved satisfactory. McMurry's founder questioned it in regard to the price. Only the testimony of another founder eventually disproved the first.¹⁰¹

By establishing connections such as these, George Tayloe hoped to provide a prosperous future for his inherited business. Based on the response expressed in these two letters, he had good reason to be hopeful. At an age when iron manufacturing was a profitable but risky business, such indications were not taken lightly. After careful consideration, and with a mind toward the future Tayloe bought the Brunswick Forge and Slitting mill form his

¹⁰¹ H. M. McMurry to George P. Tayloe letter., New York November 30, 1831. Tayloe Family Papers.

older brothers in 1833.¹⁰²

Not only did this purchase indicate the degree to which Tayloe believed in his prosperity on the National market, but also his attempt at cornering the local market as well. For \$20,000 he had increased the potential of his business two-fold. Because Cloverdale was exclusively a pig iron furnace which produced only a few castings and no bar iron, the Brunswick Forge was necessary in order to meet basic levels of the diversified industry, a fact which his father had recognized in 1810.

In addition to his iron furnace, George Tayloe also had inherited a large number of slaves. In the census of 1830, Cloverdale's slave population was 140, forty-seven being female and eighty-nine males. Not all of Tayloe's slaves enjoyed a family life. A comparison of the number of slave men to slave women between the ages of ten and fifty-five indicates that the men outnumbered the women by a margin of two and one-half to one. As might be expected, the Cloverdale Plantation relied on the strength of several single males unrestricted or encumbered with domestic loyalties.¹⁰³

¹⁰² Botetort County Deed Book # 20 Benjamin Ogle Tayloe & William H. Tayloe to George P. Tayloe. July 20, 1833.

¹⁰³ Botetourt County Census 1830. VPI&SU Newman Library., 'micro'.

Ironically, this did not wholly restrict the promiscuous nature of these single males. On May 23, 1829, the Fincastle Mirror announced that Mr. Andrew Amyx had posted a \$50 reward for the apprehension of a runaway slave named Maria.¹⁰⁴ In the attached discription, the runaway's husband was identified as the founder at George Tayloe's iron furnace¹⁰⁵ The article goes on to state that "no doubt her husband is harboring her and she is lurking somewhere about the furnace." Maria had been missing for five or six months during which time she gave birth. This fact alone justified such a large reward and it is to Tayloe's credit that immediate action was not taken on his part.

By 1834, Botetourt County records began to indicate a shift in the Cloverdale's business interests. Previous improvements and additional land acquisitions had been aimed at supporting the iron furnace. Now Tayloe had begun to concern himself more with agricultural aspects of the

¹⁰⁴ Fincastle Mirror May 2, 1829. as contained in Botetourt County History Before 1900: through County Newspapers Hellen C Caldwell ed. pp.22. This text is an edited collection of photocopied newspaper articles form 1800 to 1900.

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Cloverdale General Account Books 1810-1814. pp. 67. Pleasant was purchased by Joun Tayloe between the years 1810-1814, from Henry Robinson for \$450. No doubt the man was a well acquainted with the Botetourt area either through the freedom generally associated with the position of founder or simply native awareness.

estate. Land tax books show that during that year a new barn was built on the Tinker Creek tract at a price of \$800. This more than doubled the existing value of buildings on the property and increased the total land value to \$17,487. The Cloverdale Farm was situated adjacent to, but not included in the iron tract. The iron tract alone, was valued at \$27,759 with \$6,000 associated with buildings.

Further proof of this shift in emphasis is reflected in the sale of the Brunswick Forge. Within two years of its purchase, the forge appears on the land tax records of Thomas Shanks, a native to the Botetourt area.¹⁰⁶ One year later the property value of the Cloverdale iron tract decreased by \$2,000, due to the "decay of furnace."¹⁰⁷ Again in 1838, Tayloe sold 270 acres of the furnace land to Joseph Peal.¹⁰⁸

By all accounts George P. Tayloe was completely out of the Virginia iron making business by 1836. Apparently the last gasp effort at creating a new market in New York State, Failed. With no market to sustain it the operation went out of business. Further decay was recorded in 1845, when flooding caused additional tax adjustments in the amount of

¹⁰⁶ Botetourt County Land Tax Books 1833-1838. Thomas Shanks.

¹⁰⁷ Ibid. for George P. Tayloe

¹⁰⁸ Ibid.

\$2500.¹⁰⁹

Tayloe experienced no great economic setback as a result of the furnace going out of blast. As it turned out, he continued to build on his father-in-law's tobacco interest at Buena Vista establishing trade connections and warehouses for this end.¹¹⁰ By 1850, he had sold nearly all of the original property including ore banks and farm land to Henry Langhorne, his wife's brother who in turn, sold it to Thomas Shanks.

Cloverdale furnace # 1 was established at a time when Southwest Virginia was little more than frontier. The first iron smelted there was directed for use in the local economy. Planters, merchants, and yeomen were dependent on such institutions for simple metal tools and equipment. In 1810, when John Tayloe III bought the establishment it was still functioning in this manner. However, there is no doubt that if Cloverdale # 1 ever did reach a National market, it was during this ownership. As an extremely wealthy planter-merchant, he had the necessary connections which were needed to survive in this type of market. Unfortunately, this was not true of his son George Tayloe. After a few unsuccessful years, he realized that continued

¹⁰⁹ Botetourt County Land Tax Book 1839-1845. George P. Tayloe

¹¹⁰ Clair White, Roanoke, 1740-1982. pp. 42.

operation of the furnace was not profitable. Therefore, he made a calculated decision to retire the furnace and advance his tobacco interests.

When Cloverdale # 2 put into blast for the first time Cloverdale # 1 was fast becoming a memory. Ironically, this was also true of the local based economy. The 1830's and 40's marked a watershed in iron technology as well as National economic growth. Cloverdale # 2 was built in this context.

Chapter V

CLOVERDALE 2, THE NEW AND THE OLD

By the mid 1830's many Southerners who had been planter-manufacturers, abandoned their dual occupations to focus on either agriculture or industry. Generally, but not exclusively, those living near the prospering Eastern cities, opted for industrial pursuits while those in the more remote, western lands turned toward agriculture. Not only was this fact based on the nature of the national shift in economy, transportation and industrialization, but also on growing technological advancement. As a logical conclusion to consolidation and centralization, manufacturers began to direct a great deal of their attention to improving their processes. In order to maintain a competitive edge, it became necessary for companies to expand their operations and to make them more cost effective. Quality became second to quantity and profit actualization became the sole indication of success.

Between 1840 and 1850, profits from the United States iron industry were precarious. There was competition between centralized foundries, operated in a vertically integrated process, and the interdependent rural furnaces and urban refineries. Each was able to to minimize costs,

albeit by different means; each reduced the profit margin of the other. The rural furnaces still used the primitive cold-blast process which was labor intensive, but not capital intensive. Some have described this as belonging to a craft tradition rather than one of systematic technique.

Richard Schallenberg has made the convincing case that America was not ready to abandon this type of manufacture until maturation of the nation's transportation system at the end of the 1800's.¹¹¹ Not only was it difficult to transport raw materials to and from the remote locations, but the technology used to process the raw materials did not lend itself to large scale transit. For instance, the charcoal fuel used to heat the ore was also linked to craft technology. Retorts and charcoal kilns had not proved successful, nor were they abundant enough to warrant a shift from the primitive and mobile charcoal 'pit' to the stationary charcoal oven. Regardless of England's success with anthracite coal as a fuel, America was not geared toward this either. Abundant though it was, the vast reserves of United State coal had not been opened to such endeavors. There were a few anthracite fueled furnaces in the United States by 1830, but not until after the Civil War

¹¹¹ Annals of Science vol. 32 (1975) pp. 341-358, .
"Evolution, Adaptation and Survival: the Very Slow Death of the American Charcoal Iron Industry" Richard H. Schallenberg., p.342.

did coal's use become popular.¹¹² Massive industrial restructuring is an evolutionary process and does not happen quickly.

Another reason which helped impede the centralization of American iron industries prior to 1860 was the quality of iron smelted with charcoal. Such iron contained fewer impurities than did coke-smelted iron. The presence of silicon in iron is an indication of its strength. An excess of silicon depresses the solubility of the carbon presence and does not provide durability. Such iron is hard to temper and cannot be considered a "good general purpose iron."¹¹³ As long as it was still profitable to make iron in charcoal furnaces, there was no real incentive to switch to coke. Yet areas which had maintained furnaces for several decades and whose production was much greater than that of a simple 'annex' furnace were the first to switch to coal. This was particularly true in the great iron-producing state of Pennsylvania.

Another reason for the lengthiness of the transition from charcoal to coal was the relative inexpensiveness of building and operating a simple blast furnace. When George P. Tayloe abandoned his furnace, the question of lost

¹¹² Ibid p. 343.

¹¹³ Ibid p. 344

capital no doubt entered his mind. However, he was also aware that his farming business was potentially more profitable. George Tayloe's Cloverdale Furnace tract totalled 2721 acres and was valued at \$27,759. Of this total price, \$6,000 represented the value of buildings. Subtracting the building value, the total price per acre was \$7.90. The Cloverdale farm property was valued at \$17,487. The building value was \$1,500. The total price per acre, minus the value of the buildings was \$10.60 per acre.¹¹⁴ Assuming that the farm land was well developed, free of stumps and rocks, it can be concluded that similar farm land sold for around \$10-\$11 per acre. Because the iron furnace tract was valued at nearly \$8 per acre it can be assumed that it held promising potential for use in agriculture. With this in mind, it is not surprising that the furnace itself was valued at little more than 1/4 of the total price.

Like many of the successful antebellum industrialists, John Anderson and Thomas Shanks were Whigs. They opposed relaxation of iron duties and advocated strong protection. Similarly, they actively supported extensions of the James River and Kanawha canal.¹¹⁵ The Anderson and Shanks families

¹¹⁴ Botetourt County Land tax Books, 1820-1826 & 1833-1838., George P. Tayloe

¹¹⁵ Charles Dew, Iron Maker to the Confederacy: Joseph R.

had deep roots in the Botetourt area. Like George P. Tayloe, Henry Langhorne, James Breckenridge, and Robert Harvey, they aquired land, prominence and the status befitting regional gentlemen. Both John Anderson and Thomas Shanks were Gentlemen Justices of the County and members of the Virginia House of Delegates as representatives of Botetourt and Craig Counties, and Botetourt and Roanoke Counties Counties.¹¹⁶

The Anderson family was particularly remarkable in regard to their motivation and achievements in industrial and political pursuits. In an address given before the Fincastle High School graduation assembly on June 20, 1873, Judge Thomas Houston expressed the community's sentiment.

If [Colonel William Anderson] were living today he would have just cause to be proud of his three sons, Joseph R., John T. and Frank T. Anderson; the first representing the soul and brains of the great Tredegar Iron Works; the second reposing upon the laurels of public life; and the third filling the highest judicial position in the state.¹¹⁷

Anderson and the Tredegar Iron works. New Haven, Conneticut: Yale University Press., 1966 p. 38,; John Anderson had three brothers, Francis, William and Joseph. Both of whom were also Whigs. Thomas Shanks had one brother and he was a Whig as well. Stoner, A Seed-Bed of the Republic. p. 272.

¹¹⁶ Robert Stoner, A Seed-Bed of the Republic pp. 440, 444.

¹¹⁷ Thomas Shanks purchased the store from Mrs. William Patton in the Fall of 1831 under the firm and style of "Thomas Shanks and Company." Fincastle Patriot, November 11, 1831: Botetourt County History Before

In addition to similar political interests, both the Anderson and Shanks Families were concerned with iron manufacturing. In November of 1831, Thomas Shanks began operation of the General Store which he had purchased from the estate of William Patton deceased.¹¹⁸ With a local outlet for castings, ties to suppliers of other goods and with a base for leverage, he bought the Brunswick Forge on credit in the same year.¹¹⁹ Unfortunately for Thomas Shanks, George Tayloe who sold the forge, was more attuned to the realities of the regional market and came out the better in the transaction. As Shanks painfully found out, little potential existed for a small, rural forge when integrated and centralized foundries and refineries were establishing their dominance. The day of the small, independent forge was over.

If Thomas Shanks felt despair, it did not last long. In five years he, Frank Anderson and John Anderson joined in a partnership designed to reconstitute the Cloverdale Iron Works. Shanks had made overtures towards purchasing the original Tayloe land, and actually had purchased some from

1900: Through County Newspapers Helen C. Caldwell ed. p.24.

¹¹⁸ Botetourt Conty Land Tax Book, 1832-1838., Thomas Shanks.

¹¹⁹ Helen C. Caldwell ed. Botetourt County History Before 1900: Through County Newspapers p.45.

George Tayloe's brother-in-law Henry Langhorne, but the area was worked out and he had to find a new location.¹²⁰ The three men agreed to move the furnace west of its original site, hoping to cut transportation costs in addition to utilizing previously untouched raw materials. Furthermore, the decision of the Commonwealth of Virginia to aid in the construction of the James River and Kanawha Canal extensions to Buchanan, guaranteed cheaper and swifter transportation which might enable the Cloverdale firm to reach the statewide market. The distance from the new Cloverdale site to Buchanan was about eighteen miles.

In choosing the new site the partners not only took into account the abundance of untouched raw materials and transportation costs, but also the availability of a sufficient source of water to provide power.

The new Cloverdale Company began buying land on Back Creek in the early 1840's. Botetourt County Deeds indicate that the first purchase took place in July of 1843. Soon afterwards, Anderson, Shanks and Anderson built their furnace.

The first parcel of the new land contained 150 acres which the partners bought for \$500. This was the minimum acreage necessary to begin such a venture.¹²¹ Although the

¹²⁰ Botetourt County Deed Book # 27, p. 455.

original parcel contained good stands of timber, they bought additional raw materials from adjacent land owners.

Additional land was mandatory if a successful iron works was to take hold. In March of 1845, the company purchased 350 acres for '\$4,048.75.'¹²² On May 5, 1845 they bought another 348 acres for \$2,628.¹²³ At \$11.5 per acre, the property purchased in March had presumably been good, low lying farm land. The property acquired in May, sold for \$7.5 per acre, but included part of the mountain. The original tracts sold for only about \$3 per acre. This parcel was nearly all mountain land used for coaling. Apparently Anderson, Shanks and Anderson, were willing to utilize potential profit bearing farm land, in their iron furnace property and during the next decade they added other tracts, for a combined total of 7,488 acres.¹²⁴

Unlike Cloverdale Number 1, records remain which give relative clarity to the type of furnace stack built by Anderson, Shanks and Anderson. John Lesley in his monumental collection of 19th Century furnace and forge statistics, Iron Manufacturer's Guide, (1859), suggests that it was a

¹²¹ Botetourt County Deed Book, # 27 p. 525.

¹²² Ibid, p. 231.

¹²³ Ibid p. 382.

¹²⁴ Botetourt County Land Tax Book, 1846-1850. John Anderson.

cold-blast furnace standing thirty-seven feet high. Its location was seven and one half miles southeast of Buchanan, Five miles south of the James River, eight miles east of Fincastle and 200 miles east of Richmond.¹²⁵ In 1856, the furnace produced 1,120 tons of pig iron. Other Botetourt County furnaces described by Lesley include: Roaring Run, Grace, and Aetna Furnaces. Roaring Run Furnace was located on Craig's Creek and stood thirty-six feet high. It produced 800 ton in thirty-five weeks. Grace Furance, owned by Thomas Shanks, was also located on Craig's Creek. It stood thirty-three feet high and produced 900 tons of pig in twent-six weeks. Aetna Furnace established on Purgatory Creek, was thirty-five feet high and produced 700 tons in twenty-two weeks.

Because Lesley used production rates from 1856, his statistics are not clear indications of previous or continuos trends. According to Lesley, Cloverdale 2 was built about 1841. Even with this date adjusted to 1843, the only other operational furnaces in the vicinity were Grace and Aetna. Aetna was built in 1792 and went out of blast well after the 1850's. Grace Furnace was built in 1849 as a joint venture between Thomas Shanks and James Patton, and Roaring Run Furnace was built in 1832 and closed in 1854.

¹²⁵ Lesley, Iron Manufacturer's Guide to Furnaces and Forges. p. 72.

In 1856 Cloverdale 2 was producing more iron than any of the other Botetourt County furnaces. In that year it produced thirty-five tons per week. Grace Furnace followed with thirty-four tons per week, Aetna at thirty-two tons and Roaring Run Twenty-three. The fact that Cloverdale produced thirty-five tons per week in 1856 does not suggest that such was the case in the mid 1840's. At its peak Cloverdale was the most productive furnace in the area. (see table 4)

Many industrial historians have linked the size of a particular furnace to its production. Based on Richard Schallenberg's Furnace height to construction date ratio, Cloverdale Number 2 was a little larger than the national average in 1856.¹²⁶ The average height of a charcoal furnace in 1828 was about thirty to thirty-two feet. It can be assumed that Cloverdale Number 1 was no larger than this. Therefore, in addition to moving the furnace location, the partnership also took the opportunity to enlarge its capacity and efficiency by adopting more advanced designs.

Table 4 shows that Cloverdale Number 2 was a cold-blast furnace. This is an unusual detail when considering that Cloverdale Number 2 was the largest producer of iron in a group of four furnaces for which two utilized a hot-blast.

¹²⁶ Annals of Science vol. 32 (1975). "Evolution, Adaptation and Survival: the Very Slow Death of the American Charcoal Iron Industry" Richard Schallenberg, p. 351.

TABLE 4

Botetourt County Charcoal Iron Furnaces: 1789 - 1856

Name	Dates	Status	Type	Production
Roaring Run	1832-54	Abandoned	H-blast	22.8 tons/wk
Grace	1849-	Operational	C-blast	34.6 tons/wk
Rebecca	181?-1852	Abandoned	C-blast	NA
Jane	1830-50	Abandoned	C-blast	NA
Retreat	1827-49	Abandoned	NA	NA
Cloverdale 1	1789-1835*	Abandoned	C-blast	NA
Cloverdale 2	1843-**	Operational	C-blast	35 tons/wk
Aetna	1792-	Operational	H-blast	31.8 tons/w
Catawba	1790-1849	Abandoned	NA	NA

* corrected date from 1830

** corrected date from 1841

Source: J.P. Lesley, An Iron Manufacturer's Guide p. 72

There can be no doubt that the hot-blast technique was more advanced and offered a more efficient firing. It differed from the cold-blast in capturing hot air and gases which would otherwise have escaped through the top of the stack. The process redirected the hot air and gases through metal pipes and back to the bellows or "blast" equipment. This resulted in a hotter fire and greater fuel efficiency. The fact that Anderson, Shanks and Anderson did not adopt the improved technology, but nonetheless were the largest producers afforded a contradiction to this generally accepted premise.

Although a hot-blast furnace was more efficient, it was not necessarily more productive. The advantages were calculated based on cost per ton of iron produced. Although specific records which would express this ratio have not been found for the Botetourt County Furnaces, general statistics reveal that fuel costs were reduced by forty to seventy per cent as a result of using the hot-blast technique.¹²⁷

While the specific improvements made to the furnace stack were less dramatic than might be expected, there was clearly a conscious effort to promote efficiency. Relying

¹²⁷ Peter Temin, Iron and Steel in Nineteenth-Century America: An Economic Inquiry Cambridge, Massachusetts: The M.I.T. Press., 1964 p. 58.

on the furnace to height ratio, it is obvious that the size of the stack was not arbitrary. At the time, Anderson, Shanks and Anderson realized that increased temperatures and larger furnace capacity was more profitable than incorporating a hot-blast process.

If charcoal was abundant and cheap, then incentive for hot-blast reconstruction would be minimized. The fact that Cloverdale Number 2 was situated in a remote area, and supplied with abundant timber makes the need for fuel saving devices less urgent than in those areas where wood was not as available.

In the history of charcoal ironmaking there appears to be three phases of development, based on economic limitations and technological advancement. Cloverdale Number 1 represented the first phase. Built around 1789, it was constructed for a local market and based on a craft technology. Cloverdale Number 2 was built to produce for a regional market and it benefited advanced understanding of height to production ratios and improved of blast

Although the peak of charcoal iron furnace utilization took place in the second phase, third phase production levels were far higher than in previous years. By this time consolidation was complete. Third phase furnaces stood in excess of sixty feet high by 1900, and their production

figures were well into the tens of thousands of tons per year. Production of charcoal fuel had guaranteed by-products more valuable than the charcoal itself, and iron companies were able to supplement their regular income with sales from turpentine and other derivatives.¹²⁸

Keeping in mind the shift in market potential and the national economy, there can be no blame directed at the new Cloverdale company for attempting to be more than a dependent pig iron furnace. Anderson, Shanks and Anderson realized the necessity of and established a strong link with one eastern foundry in particularly with Joseph Anderson's Tredegar Company in Richmond. Unlike the Tayloe's Cloverdale Number 1, Cloverdale Number 2 was sure of its market. Therefore, the necessity for self-sufficiency and independence was minimized. In practical terms this meant that more time and energy could be spent on iron production and less on subsistence. George Tayloe's Cloverdale Number 1 included an extensive agricultural subsidiary which produced a surplus for external sale. Although Cloverdale

¹²⁸ For details of the effects of this phenomena see: Richard Schallenberg, "Technological Inovations in the American Charcoal Iron Industry, 1830-1930" Thesis, Polytechnic Institute of Brooklyn., 1970. also found in Special Collections of the Newman Library, VPI&SU., Technology and Culture vol. 18 (1977) Chicago, Ill. pp. 436-466 "Raw Materials Supply and Technological Change in American Charcoal Iron Industry" Richard Schallenberg, & David Ault.

Number 2 did produce some basic staples, most of the farming done on its property was private enterprise, instigated by individual laborers in their free time. Basic produce and staples were provided by capital from the owner's other agricultural and commercial endeavors. The Andersons owned several tracts of farm land and Thomas Shanks owned a general store.¹²⁹

The story of the American iron and steel industry after 1830 is the combined result of increased in fuel efficiency, technological improvements and centralization. Cloverdale Number 2 had a very small role in this evolutionary process. In part, this was the result of the owner's limited ambitions. They remained loyal to a concept of colonial dependence. Manufacture of iron at a rural furnace was dependent upon its subordination to an urban centralized refinery. Never would such a furnace meet a specialized market as before the American Revolution. Production was aimed at pig iron sales to large foundries. Only the superior quality of the iron made at the furnaces gave them a chance to rise above mediocrity.

¹²⁹ Botetourt County Land Tax Books, 1839-1845. John Anderson.

Chapter VI

CANAL COMMUNICATION BETWEEN CLOVERDALE AND TREDEGAR

While the quality of Cloverdale iron insured the company of a continuous market, there were other factors which were also necessary for the furnace's success, of which the most important was transportation. Cloverdale Number 2 was not a diversified iron enterprise designed to supply the local market, but rather an 'annex' furnace. It was dependent on a reliable transportation link out of the valley. If transportation to foundries in the east could not be established, the furnace would have gone out of business.

It was only natural that all manufacturers in Southwest Virginia were strong supporters of the canal extensions and improved roadways. By the late 1840's the Anderson family had established a long history of participating in such matters. Beginning in 1793, John Anderson's father, William, had been appointed Surveyor of Botetourt County. Later he had served as county Magistrate, Commissioner of James River and Engineer of Public improvements.¹³⁰ Through these various occupations William Anderson was successful in stimulating his fellow citizens to devote their resources to

¹³⁰ Stoner, A Seed-Bed of the Republic p.270.

sound local internal improvements. In so doing he had implanted in the minds of his children the concept that such developments were necessary and to others that the Anderson family was both forward looking and responsible.

Internal improvements and the canal extension had a long history, but they became what was probably the most important issue in state and local politics in the 1830's. early as the 1830's. In the Campaign of 1839 John Brockenbrough of the city of Richmond was under consideration for the Democratic nomination. Since it was well known that he was the President of the the Farmers Bank of Virginia, his supporters felt it necessary to reassure western Virginians

that he is in favor of constructing, upon liberal terms, a South-Western Improvement, either a Rail or McAdamized Road from the Tennessee line to connect at the most eligable point on the River with the James and Kanawha Canal improvements, Thus opening the avenues of communication from all parts of the state.¹³¹

In July of 1845, John T. Anderson presented before a public meeting in Fincastle, the preamble and resolutions of a steering committee on internal improvements. The committee declared that "a generous system of internal improvements was

¹³¹ Buchanan Commercial Journal (September 27, 1839), as quoted in Hellen C Caldwell, ed, Botetourt County History Before 1900: Through County Newspapers. Hellen C. Caldwell ed. p.30.

only means by which a adequate stimulus can be given to the enterprise and industry of the people of Virginia, and her boundless resources developed . . . And we regard the James river and Kanawha Improvements and a McAdamized, or Rail Road, from the Tennessee line to some point on James river. . . rank first in importance to the state and demand the immediate consideration and fostering aid of the Legislature.¹³²

On October 30, 1845, Fincastle was the site of a convention of delegates representing the counties of the Valley and in Western and Southwestern Virginia. Of those representing the Botetourt and Roanoke areas were included: Thomas Shanks, George P. Tayloe, John Anderson and Francis Anderson. The convention named five delegates to draft and present a petition to the Virginia General Assembly which amounted to almost an ultimatum. Boldly, they asserted that the state either provide for a canal extension, or permit the Baltimore and Ohio Railroad to extend its line down the Shenandoah Valley and through the Kanawha Valley to the Ohio. Richmond and Norfolk were enlisting the patriotic sentiments of most of the state in denying the B & O's request for such a route and raising fears that Baltimore would thus capture a major portion of Virginia's commerce. The Fincastle petitioners claimed that they would prefer an improved link with Richmond, but they showed their

¹³² Fincastle Democrat July 22, 1845
as quoted in Botetourt County History Before 1900, p. 33.

willingness to consider the out-of-state alternative. John Anderson and Thomas Shanks were two of these delegates.¹³³

The need for improved transportation from the upper James River Valley was not exclusive to those interested in the iron industry, but they were the forefront of its western advocates. The urgency that the Cloverdale partners felt for strengthening their link with the Tredegar Works in Richmond was reciprocated by Joseph Anderson. Indeed during the 1850's and 1860's when iron manufacture became increasingly centralized, the Tredegar Company began to purchase annex furnaces because their survival and supply became essential to the survival of Tredegar. As a confirmed Whig, Joseph Anderson was already aligned with the national advocates of internal improvements. A sincere advocate for the present and future growth of his beloved Virginia, Anderson was committed to trade links with the western lands. His influence, was great in political and non-political and in non-official and official capacities. He was elected to the Richmond City Council in 1847 and served five terms. He used his appointment to the important committee on Roads and Internal Navigation to promote measures calling for state support for railroads and canals."¹³⁴

¹³³ Ibid

After the Commonwealth's appropriation of \$1,236,000 in 1847, the James River and Kanawha Canal extension began to take shape west of Lynchburg.¹³⁵ The plans for construction reached as far west as Buchanan, a distance of only about fifty miles, but far enough to save time and money in otherwise overland passage.

Ironically, the effects of the canal's extension were not wholly beneficial, since construction elevated the labor wages. Before the age of steam shovels canals were dug with pick and shovel. Although this was an appropriate task for surplus slaves, the latter were not numerous to accommodate the increased demand. Nor was there an abundance of free black labor. Canal contractors joined furnace operators in competing for laborers with various manufacturies and farms of Botetourt and its neighbors.

The actual division of labor used in constructing the canal can be inferred from census records. The man in charge was the chief engineer. Immediately subordinate to him were other engineers. These men were exclusively white and sometimes from out of state. Below them were self-professed white "canal contractors." Census returns indicate that these men were also white. Their

¹³⁴ Bruce, Iron Manufacture in the Slave Era. p.229 Dew, Iron Maker to the Confederacy. p. 39.

¹³⁵ Ibid p. 274.

para-professional status showed that experienced artificers, overseers and roustabouts, had to capitalize on the situation and that employers had to meet their demands.¹³⁶

At the bottom of the pyramid was a combination of, slaves, free blacks, native whites and Irishmen. Although some of the slaves belonged to the contracting companies, most were hired from their masters. Even though Botetourt County's "native" slave population was only 1511 in 1840, it increased to 2027 in 1850. Almost 500 slaves were brought into the area in a ten year period. Even with allowances for natural increase, the numbers suggest a conscious effort to concentrate a work force by purchasing and hiring slaves from other parts of the state.¹³⁷

In addition, Botetourt County enjoyed sizable growth from European immigration. Hard times in Europe and the availability of work at the end of a transportation artery combined to attract French, Swiss, English and particularly Irish immigrants into the area during the 1840's. Census returns for that year indicate that the total number of Irish immigrants was 423. Of course Botetourt County was just one of many areas in the country which opened its arms to immigrants and utilized their resources with honest

¹³⁶ Botetourt County Census 1850.

¹³⁷ Botetourt County Census, 1840.

intentions. In a society largely supported by slavery, immigrant labor often had been overlooked and not given enough credit for their physical contributions. In the case of Botetourt County, they made the difference between the conception and reality of the canal extension.

In November of 1851, the canal between Lynchburg and Buchanan was complete.¹³⁸ Up to that point Lynchburg had been the undisputed center for Southwest Virginia trade. Buchanan residents sought to improve the potential of their inland port. In the four years between legislative approval and the actual completion of the canal, they constructed several warehouses for tobacco, wool, grain and iron. William T. Hardy built such an "adforwarding House." While advertising for business he assured the public that he would provide "a large and convenient lumber house, situated immediately on the river bank, with a good wharf and all the necessary fixtures for loading and unloading wagons."¹³⁹

Like most warehouse operators, Hardy had been involved in canal transport. Prior to the canal's completion, he operated batteaux between Lynchburg and Richmond.¹⁴⁰ In this capacity that he had become associated with the Cloverdale

¹³⁸ Stoner, Seed-Bed of the Republic. p. 412.

¹³⁹ Fincastle Democrat (December 5, 1851) found in Botetourt Conty History Before 1900 p. 38.

¹⁴⁰ Botetourt County Census, 1850

Furnace and Tredegar. He transported Cloverdale iron down stream to Lynchburg in batteaux and on to Richmond in canal barge. In 1839, Hardy charged \$1.50 per barrel and .75 per 100 pounds going down stream. Coming up stream he charged \$1.00 - \$1.25 per 100 pounds of general cargo, \$1.50 per sack of salt and \$12 per ton of plaster.¹⁴¹

For Anderson, Shanks and Anderson concern for transport was a fundamental; their dependence on Richmond and Eastern markets required that their shipments reached their destinations on time. Before the canal's extension, this was sometimes uncertain. In June of 1846, their iron shipment was not transferred immediately from batteaux to boats at Lynchburg. Their cargo was left overnight on the river bank. Before daybreak thieves stole a great deal of the iron. At the very least this incident interrupted Tredegar's production efficiency and reduced Cloverdale's in profit. Neither could stand such a misfortune very often.¹⁴²

¹⁴¹ Buchanan Commercial Journal, (September 1839) quoted in Botetourt County History Before 1900. p. 30.

¹⁴² Joseph R. Anderson to J. R. Renwick of Lynchburg., June 25, 1846: Tredegar Letter Book (December 3, 1845 - May 11, 1847) hereinafter cited as 'Letterbook' Tredegar Papers., VSL. Richmond, Va.

There were other problems incurred through interruption of normal trade patterns as a result of canal construction and climate changes. One of these was the conflict between Tredegar's constant demand and canal construction. Canal construction was threatening enough to cause Joseph Anderson to write to furnace operators living beyond Lynchburg, in December of 1847, requesting that they ship their iron by batteaux to the furthestest point accessible by canal transport as soon as they could. It was essential, he pointed out, that Tredegar receive the shipment before ice or winter storms made transportation impossible. Otherwise, he would have to go north for his iron, or stop production altogether, much as either alternataive would displease him.¹⁴³

Even though the immediate problem of supply ws resolved before winter, the long-term one was not. There was no way to insure against interuptions of supply between Cloverdale and Tredegar, despite recognition that profitable production by this centralized industry depended on continuous production which depended on continuous supply.

¹⁴³ Joseph R. Anderson to Anderson, Shanks and Anderson. December 18, 1847; Letterbook, September 30, 1847 - May 14, 1849., Tredegar Papers., VSL. Richmond Va.

In spite of Joseph Anderson's threats to seek out-of-state supplies of pig iron, he really preferred Virginia pig. Even when home supplies were short, it was inconvenient and time consuming to make contacts, agree upon prices, and arrange transportation.

Similarly, Cloverdale's need for income was so great that it bent every effort to satisfy Tredegar's voracious appetite for pig. During the 1840's and 1850's, Anderson, Shanks and Anderson manufactured almost exclusively for the Tredegar Company. For the Cloverdale partners nothing could have been more profitable than to have Joseph Anderson as President of the Tredegar Works.¹⁴⁴

The basic mechanics of transportation were simple. In addition to the transporting of goods, boatmen were required to keep cargo receipts indicating what and when a product was transported, where it was taken, and who owed money for it. Upon receiving a shipment of iron, Tredegar paid carriers such as J. B. Renwick and Company of Lynchburg, for transportation at once. It paid for the iron later.¹⁴⁵

¹⁴⁴ There were three major transport companies which Cloverdale and Tredegar used to ship their merchandise. They are: J.B. Renwick & Company, McDaniel & McCorkle and John Budkin.

¹⁴⁵ Joseph Anderson to J. B. Renwick & Company., June 25, 1846; Letterbook, December 3, 1845 - May 11, 1847.

In 1850 there were fourteen boatmen in Botetourt County.¹⁴⁶ The term "boatmen" refers to those men in charge of canal or batteaux boats rather than to the boat's crew. The crew consisted of common laborers, usually free blacks or hired slaves. Boatmen were both white and black, but always free. While the crew had little potential for social and economic advancement, the same was not true of the boatmen. As captain of a boat, they warranted a status equal to colliers, smiths or carpenters.¹⁴⁷ In 1850, there were two boatbuilders living in Botetourt County.¹⁴⁸ Although their market was no doubt limited to the patronage of transport companies and various manufacturers, the fact that they existed at all again reflects the county's concern with river navigation. (see table 5)

The distance between Buchanan and Richmond was about 200 miles. Depending on the weather, it was possible to make the trip in ten to twelve days. The large boats were capable of carrying as much as forty tons per trip.¹⁴⁹ According to William Hardy's prices in 1839, it cost \$15 to transport one ton of iron to Richmond while forty tons would

¹⁴⁶ Botetourt County Census, 1850

¹⁴⁷ Dew, Iron Maker to the Confederacy. p. 253.

¹⁴⁸ Botetourt County Census, 1850

¹⁴⁹ Ibid p. 253.

TABLE 5

Boatmen Employed in James River Navigation: 1850

Name	Age	color
Alexander Crawford	47	W
William Anthony	45	W
John Pauplin	50	W
Francis Banister	50	M
Henry Evans	47	W
William Brackens	37	M
John Molp	37	B
Matthew Anderson	35	W
George Liggon	35	B
Madison Beverly	36	M
William Hardy	43	W
Leslie Hardy	17	W
Thomas Jones	28	B

Source: Botetourt County Census, 1850

cost \$600, clearly a handsome fee for ten days work.

Throughout the 1840's and 1850's canal export and transportation was exclusively controlled by transportation and storage firms. Many of these firms were well established in river navigation long before the canal was extended, and it was a logical step from batteaux to barge. By the 1860's this began to change. In keeping with intentions for vertical integration and tightening the link between 'annex' furnaces and Tredegar, Joseph Anderson bought his own canal boats and employed his own slaves in their operation.

For Anderson, Shanks and Anderson, at Cloverdale and for Joseph R. Anderson at Tredegar, the long battle to extend the James River and Kanawha Canal, was well worth the fight to unite Richmond and Botetourt. Each company was dependent on swift and reliable transport and the canal satisfied these needs. The majority of Botetourt County residents were indifferent about plans to extend the line of the canal west of Buchanan and did not grieve when the Commonwealth ceased to fund that construction in the 1850's. They were satisfied with closing the gap between Richmond and Buchanan.

Chapter VII

LABOR AT CLOVERDALE

So far as the iron industry was concerned, Virginia's economy as late as 1860 may be viewed as a state of prolonged emergence from economic colonialism. Any part of iron production required a considerable investment of capital to insure reliability and the maturity of that part of the process's maturation. Given a slave economy, to postpone, for however short a period, devoting capital to the purchase of slaves enabled an iron producer to maximize the use and effect to which he put his capital and at the same time to enjoy the lower labor costs of the prevailing institution of slavery.

Although the institution of slavery was the dominant source of labor in antebellum Botetourt County, in no way was it exclusive. The manufacture of pig iron at Cloverdale Number 2 depended upon the labor not only of slaves, free blacks and whites, but also of hired slaves. The introduction of statewide canal and railroad construction around 1840 had brought to the county immigrant settlers and industrial specialization. Eventually the demands of the Confederate status of America brought more. Each produced a mixture of peoples working together at the valley furnaces.

The difference between Cloverdale's situation in 1800, 1820, 1840 and 1860 were largely those of degree. The furnace owners operated the first Cloverdale by using white workers in positions of authority such as overseer, iron master and furnace manager and by using the owner's slaves in the capacity of common laborers. By the 1840's and 1850's, this had changed, in keeping with the national pattern of industrial centralization. The work force became more heterogeneous, specialized and demanding of highly skilled individuals. Whether free, slave or hired, the employee gained unaccustomed leverage in seeking improved treatment and living conditions.

When Anderson, Shanks and Anderson began the second Cloverdale Company, they faced a serious labor problem. Unlike such earlier Cloverdale owners as the Tayloes, they could not draw immediately on an extensive slave labor force of their own. According to the 1840 Census, Thomas Shanks owned thirty-six slaves, ten of whom were under ten years of age. In 1840 John Anderson owned ten. In 1850 Frank Anderson owned seven, of whom four were below the age of twelve. Even considering the youth of some of these slaves, their number might appear to have been adequate for minimal iron production. Closer examination; however, reveals that Shanks and both Andersons utilized fourteen in agriculture

and only seven in manufacturing and trade. In general, a quarter of the partner's slaves were too young for heavy work. Likewise, because all three partners maintained other agricultural and/or merchantile ventures, they did not concentrate their slave's energies in working their iron furnace. As a result, Anderson, Shanks and Anderson could utilize only about one-half of their fifty-three slaves at the new furnace without causing serious labor deficiencies at their other manufacturing and agrarian ventures.¹⁵⁰

John Tayloe III had 153 slaves at the first Cloverdale establishment.¹⁵¹ Although they were utilized both on the farm and at the furnace, they constituted a larger work force than Anderson, Shanks and Anderson could meet from their own reserves. Peter Temin, in his book, Iron and Steel in Nineteenth Century America: an Economic Inquiry (1964), suggests that in the 1840's the average pig iron firm employed fifty-four laborers, nearly twice as many as available to the Cloverdale partners.¹⁵² That Temin's estimate of the number of workers needed was a conservative

¹⁵⁰ Botetourt County Personal Property Tax Book, 1850 & 1840 Census. Shanks divided his thirty-six slaves between his general store, the brunswick Forge and Cloverdale. John and Frank Anderson employed the majority of their slaves on their plantations.

¹⁵¹ Botetourt County Census, 1820.

¹⁵² Peter Temin, Iron and Steel in Nineteenth Century America: an an Economic Inquiry. p. 87.

one is substantiated by the experience of contemporary Botetourt County cold-blast furnaces of about the same size. Jane and Rebecca Furnaces employed a total of 150 laborers, of whom eighty-seven were black and sixty-three were white.¹⁵³

It is impossible to pinpoint the exact number employed at Cloverdale during the early years of operation. Records of the Tredegar Company indicate that in 1863 the work force at the furnace consisted of seventy-three hired slaves, twenty-seven male convicts, three female convicts and thirty-two whites, totalling 135. For the same year Grace Furnace, also located in Botetourt County, maintained sixty-seven slaves, fifteen convicts and thirty-seven whites for a total of 112. The new Catawba Furnace, also in that county, employed 108, eighty slaves and twenty-eight whites.¹⁵⁴ Keeping in mind that during 1863 Tredegar was under contract to the Confederate States Government, it is understandable that its "annex" furnaces were expected to operate at maximum production. Whether or not the actual furnace operators did so was beyond Joseph Anderson's control. Tredegar could contribute towards maximizing

¹⁵³ Kathleen Bruce, Virginia Iron Manufacture in the Slave Era. p. 231.

¹⁵⁴ F.T. Glsogow to Joseph R. Anderson., 1863. Tredegar Furnace Letter Book, herein cited as Furnace Letter Book.

production by providing a sufficient work force, but the Richmond concern could not insure its use.

Before Tredegar bought Cloverdale in 1862, the responsibility for securing an adequate labor force was up to Anderson, Shanks and Anderson. Besides utilizing their own slaves, and slaves hired from their close neighbors, the partners commenced to employ agents in the adjacent counties of Amherst and Rockbridge.¹⁵⁵

As table 6 indicates, the Botetourt County slaves population declined in the 1830's when Roanoke County split from Botetourt County on March 30, 1838.¹⁵⁶ That the Census of 1850 showed increased white and free black population above the 1830 figures attested to the vigor imparted to the local economy by the advent of state internal improvements, the James River and Kanawha Canal, the Kanawha Turnpike and the Salem and Bristol Turnpike. Improved transportation stimulated local agriculture and manufacturing. The Anderson and Shanks partnership were able to profit in these years of an expanding, but competitive economy. Neither they, nor Joseph R. Anderson were opposed to taking advantage of their kinship and growing relationship between

¹⁵⁵ Of the slaves hired by Tredegar and sent to Cloverdale in 1863, the majority came from these counties. Furnace Leter Book, 1863.

¹⁵⁶ Clare White, Roanoke: 1740 - 1982. p. 36.

Cloverdale and the Tredegar Company.

TABLE 6

Population Statistics of Botetourt County, 1850

Date ---- ----	White males	White females	Free blk males	Free blks females	Slave Males	Slave Females
1810	5,446	2,280	300 total		2,275 total	
1820	5,282	5,211	145	145	1,493	1,313
1830	5,920	5,878	194	192	2,237	1,912
1840	4,156	4,220	190	187	1,151	1,420
1850	5,587	5,159	203	211	2,027	1,170
1860	4,117	4,324	144	162	1,414	1,355

Sources: Botetourt County Census, 1810 - 1860

Although neither invented the use of hired slaves, each profited from the practice. Letters between John Anderson and Joseph Reid Anderson shows that the brothers often exchanged slaves between Cloverdale and Tredegar. Depending on the slave's skill and the position to be filled, the same slave might have been employed at Tredegar one year and at Cloverdale the next. An example of such a situation took place in December of 1843. Joseph Anderson informed the Cloverdale partners that a slave boy named Dennis would remain at Cloverdale for another year with the consent of his master, James A Seddon, and Seddon's agent, a Mr. Lewis.¹⁵⁷ Another instance took place in November of 1846 when the slave Cupid was employed at Cloverdale while his family worked at Tredegar. Eventually Joseph Anderson bought Cupid and his family and united them in Richmond.¹⁵⁸

The interdependence between Cloverdale and Tredegar included the practice of sharing a bonded work force when labor was in great demand. Slave agents were concerned with the well-being of their client's slaves in addition to the

¹⁵⁷ Joseph Anderson to John Anderson, December 14, 1843: Letter Book, (January 2, 1843 to May 1, 1844) p. 286.

¹⁵⁸ Joseph Anderson to Anderson, Shanks and Anderson, November 10, 1846. Letter Book, (December 3, 1845 - May 1, 1847)

price for their hire. On the basis of long association with these agents and a history of proper slave treatment, a company like Tredegar demanded and got preference over both individual employers and smaller, less prestigious firms, in the hiring of slaves. It was then possible for Tredegar to pass on this preference to Cloverdale, more so than to other valley furnaces. Even with Tredegar's help, labor demands at Cloverdale exceeded both personal reserves and hired slaves. As a result, Anderson, Shanks and Anderson had to supplement their work force from other sources.

White males made up the second largest group employed at the furnace. Many of these were immigrants from western Europe coming to America in the 1840's.¹⁵⁹ As expressed in Table 7, these white employees often maintained the higher status jobs such as founder, forgerman, Ironmaster or overseer. However, unlike Cloverdale 1, white laborers were also employed in the lesser jobs like mining and colling. Founders, ironmasters, forgermen and overseers worked apart from the slave laborers, but miners and colliers did not.¹⁶⁰

¹⁵⁹ According to the Botetourt County Census of 1850, there were 3 English, 423 Irish, 10 Scotsmen, 6 German, 1 Canadian and 1 from Switzerland.

¹⁶⁰ For a detailed account of labor stratification see, Charles Dew, "Disciplining Slave Ironworkers in the Antebellum South: Coercion, Conciliation, and Accommodation," in The Other Slaves Mechanics, Artisans, and Craftsmen (ed. by Newton Lewis & Ronald L. Lewis, G.K. Hall & Co., Boston, Mass. 1978), p. 63.

TABLE 7

Free Labor Employees in Botetourt County Furnaces: 1850

Name	Age	Color	Occupation
Harvey Wilson	46	mulatto	Forgeman
Joseph Armstrong	32	White	Forgeman
John White	45	White	Miner
Hudson Pursley	33	White	Miner
Henry Pursley	31	White	Miner
George Pass	33	White	Iron Business
Timothy Lunhinco?	42	White	Collier
Abraham Poindexter	45	Black	Forgeman
Ahoway Johnson	19	Mulatto	Laborer
Peter Johnson	17	Mulatto	Laborer
Elizebeth Johnson	16	Mulatto	Laborer
Thomas Burnes	46	White	Iron Business
Samuel Montgomery	39	White	Miner
William Olh?	50	White	Furnace
Founder			
Joseph Fisher	43	White	Collier
Alexander Gibson	40	White	Iron Maker
William Shay	30	White	Founder
Ignatious King	53	White	Founder
James Medly	64	White	Overseer
John Stanley	43	White	Overseer
Edmond Peck	35	White	Overseer
Will Medly	28	White	Overseer
Samuel Robinson	30	White	Iron Master
Joseph Henett	55	White	Collier
Achilles weed	24	White	Overseer

Sources: Botetourt County Census, 1850.

In Cloverdale's social hierarchy, the least prestigious were the last two groups employed: free blacks and black convicts. The role of free blacks in Antebellum Virginia is still debatable, but a new consensus may be forming which will dispel the mythology generated by both ultra-slavery men and ultra-abolitionists. Because large planters needed extra seasonal workers, they were glad to employ free blacks. They not only permitted, but protected free black settlements near their estates. Often, they displayed a preference for the work of free black cabinet makers, farriers, and sub-overseers above that of their own slaves.¹⁶¹

As a wartime measure, the Commonwealth of Virginia in 1863 leased black convicts to Cloverdale. In this case feelings of apprehension about their increased employment were not overlooked and despite the urgent need for labor, Botetourt County residents strongly objected to the practice. Complaints fell on deaf ears and the convicts remained until the war's end.¹⁶²

¹⁶¹ Andrew Baskin, "Free Blacks in Antebellum Franklin County, Virginia," unpublished seminar paper, VPI&SU, 1973.

¹⁶² Furnace Letter Book, 1863.

By nature Cloverdale's and Tredegar's heterogeneous work force was unstable. Sometimes race differences caused conflicts between men working together. At the Tredegar Works in 1847, a classic labor strike by skilled white laborers accustomed to the craft technique, claimed that their jobs were gradually being filled by slaves. The white furnace employees retained the idea that their positions were based on authority, skill and mental abilities above the potential of bondsmen. In answer to the strike Joseph Anderson gave notice to each of the employees involved, asking them to give him possession of his houses "as soon as practicable."¹⁶³ The advance in technology was accompanied by the inclusion of white semi-skilled laborers: traditional practices gave way to practical need. The demand for labor forced Joseph Anderson to hire who was available.

It is often thought that the difference between free labor and slave labor was payment. Of course, whites and free blacks were paid in cash for their services. That some manufacturers paid some cash to their own slaves and to hired slaves is not always appreciated. Joseph R. Anderson at the Tredegar Works was an outstanding example of such a Virginia manufacturer.¹⁶⁴ When free black labor began to

¹⁶³ Bruce, Virginia Iron Manufacture in the Slave Era. pp. 224-230.

¹⁶⁴ Eugene D. Genovese, The Political Economy of Slavery.

cost too much Anderson began to cut back on it. He revolutionized Tredegar by replacing free labor with hired slaves, not only in the areas of general labor, but also in the more advanced and skilled jobs. In essence, he answered the problem of high labor costs without compromising the quality or quantity of the industry.¹⁶⁵

Initially, there was little discrimination at Tredegar as white workers performed their duties along side free blacks and slaves. By the fall of 1847, white concern erupted in a strike. Indeed, slaves were filling the more complicated jobs such as founder, puddler and roller. White mechanics from abroad and from the North found that they gradually were being forced out of work during seasonal or market fluctuations. In a Southern state like Virginia, capital tied up in the bonded laborer. Because of uncertain markets, one could not always sell iron for cash, and it often was hard to hire labor.

Although the labor problems which Joseph Anderson faced were more sophisticated than those at the very much smaller Cloverdale establishment, there is no doubt that similar economic considerations operated there. White employees were particularly subject to dismissal in situations where

New York: Random House, . 1967. p. 225.

¹⁶⁵ Bruce, Virginia Iron Manufacture in the Slave Era. p. 232ff.

skill was not an occupational requisite.

The preference for slave labor took on other dimensions. It was much cheaper to hire slaves from year to year than it was to pay wages for free labor. The other dimension was treatment. Because slaves were property, their net value was not defined in terms of exploitation. Slaves were valuable and demanded a certain degree of respect and protection while free labor was responsible for itself. Consequently, situations arose where slaves were given jobs which were less dangerous than those given to other employees. Sometimes hired slaves were protected by their contracts. To insure that danger did not befall their slaves, owners often required conditions of renter guarantees. In the instance of the slave Dennis' renewed contract, Mr. Seddon insisted that the Cloverdale partners not require the boy to work underground.¹⁶⁶

Anderson, Shanks and Anderson were fair in their treatment of furnace employees and did not resort to force or bullying. Laborers both free and slave alike, enjoyed a healthy environment stimulated and reinforced by the family unit, whose preservation was such a great concern to John and Joseph Anderson that the former purchased Cupid, his wife and eight childrn for the sum of \$3,000 and moved them

¹⁶⁶ Joseph Anderson to John Anderson, December 14, 1843. Letter Book., (January 2, 1843 - May 1, 1844), p. 286.

to Tredegar in time to enjoy Christmas together.¹⁶⁷

In keeping with the traditional social structure of rural charcoal iron furnace establishments, Cloverdale's workers lived in small buildings near the place of their occupation. The miners lived near the mines, the wood-cutters and charcoal burners near their hearths and the furnace-men near the furnace.¹⁶⁸

In addition to shelter, Anderson, Shanks and Anderson provided their laborers with clothing and food. Instead of growing what food was needed as Cloverdale 1 had done, the new Cloverdale partners purchased their necessaries from both local and eastern markets. After Tredegar bought the furnace in May of 1862, Joseph Anderson bartered food with hay which was grown on the the furnace lands.¹⁶⁹

Correspondence between Anderson and his agent, F.T. Glasgow, made mention of his personal attention to purchases of food, clothing and livestock shipments sent to his

¹⁶⁷ Joseph Anderson to Anderson, Shanks and Anderson, November 10, 1846. Letter Book (December 3, 1845 - May 1, 1847).

¹⁶⁸ Confirmation of this traditional habitation arrangement depends in part on observation of the mining site. Located on Back Creek Road, (now called County Route 640), there stands a small town identified on the vellamont Geologic Survey Quadrangle as "Spec." Behind the deserted General Store, is a long row of old miner's houses today used for as cow sheds.

¹⁶⁹ Furnace Letter Book, 1863.

brother's furnace in Botetourt County. In the month of February 1864, alone, Tredegar sent 199 hogs to Cloverdale which were intended to feed the laborers there.¹⁷⁰

During the fifty years after John Tayloe III acquired the furnace, Cloverdale provided an illustration of the overall national change in the labor force as well as in the technology of the nineteenth century charcoal iron furnaces. Expensive industrial centralization, the economy of scale and the quest for at least a regional market rendered the self-sufficient iron plantation impotent. Traditional labor roles witnessed a decline of the role of the craftsman and an increased reliance on the interchangeable toiler.

Indeed by the 1860's when at its peak, Cloverdale's fate was written. By design, small rural charcoal iron furnaces were independent. They could not long endure the stress accompanying dependence such as that which developed between Cloverdale and Tredegar. Ultimately, the small, rural charcoal furnace met a technological defeat because of inability to obtain a steady supply of ore and/or charcoal and the consequent inability to supply a predominant purchaser with a steady supply of pig iron.

¹⁷⁰ Ibid

Chapter VIII

CLOVERDALE, CANNON AND THE CONFEDERACY: AN EMIRICAL EMPIRE

Although the existence of Cloverdale Number 2 depended on improved transportation links with Richmond and a relatively constant supply of labor, the cause for its success was the special character of its iron. It was for this reason, more than any other, that when railroad construction dominated the iron industry, Cloverdale succeeded in obtaining part of the competitive national market, using the Tredegar Iron Works as its agent. In 1850, clients in New York, Tennessee and Baltimore requested, by name, the pig iron which Anderson, Shanks and Anderson were producing.¹⁷¹

This iron was particularly well suited for ordnance. Tredegar used it to cast cannon for the United States War Department before the Civil war and during that conflict, for the Confederate Government. The existing close relations between this Botetourt County furnace and the Richmond Iron Works, evolved from one of mutual dependence into one of national necessity.

¹⁷¹ Furnace Letter Book, 1863.

The 1840's surge of nationalist spirit expressed in John L. O'Sullivan's phrase, "Manifest Destiny," prompted federal appropriations for national defense and security. While the 1845 - 1846 dispute between the United States and Great Britian over Oregon, fueled this concern and prompted increased military strength; the outbreak of war with Mexico insured it.

In the Tyler and Polk administrations, when the United States was still negotiating with the Mexican government, Tredegar's agent/partner, Joseph R. Anderson, courted U.S. Government contracts. As a West Point Graduate and former assistant engineer in the Engineer Bureau at Washington, Anderson's personal contacts were valuable assets. He hoped not only for profits from orders placed in a time of crisis, but for contracts that would allow Tredegar partial freedom from "fluctuation in the iron trade."¹⁷²

Initially Tredegar supplied the Government with chain cable, but by June of 1843 it was delivering cannon.¹⁷³ Thorough testing of these guns was necessary to insure strength and durability under fire. Sixty of Tredegar's first guns passed this inspection. Unfortunately, a second shipment of forty was endangered when the first five burst

¹⁷² Bruce, Virginia Iron Manufacture in the Slave Era. p. 192.

¹⁷³ Ibid p. 192.

during the tests.

To counteract this "disaster of 1843," Joseph Anderson offered to replace the lost cannon if the ordnance contracts were continued. The best reason for the government accepting this offer, was the inefficient, experimental nature of American munitions makers, as seen with the explosion of the trial gun on the U.S.S. Princeton. The disaster caused only momentary damage to the reputation of Tredegar ordnance. Largely it caused Joseph Anderson to undertake efforts to prevent a recurrence, as illustrated by his letter to his brother John Anderson in 1845:

It is very important that we get the metal for the trial gun. Please say to Colonel Shanks that it is very important that the metal intended for the gun should be selected with great care making that which is the least doubtful No. 2 with white paint to prevent the least possibility of the iron being mixed at Lynchburg- we should do everything to prevent a repetition of the disaster of 1843.¹⁷⁴

Other steps taken by Anderson in order to insure Tredegar's good faith and secure the Government's trust, were to reconstruct the blast furnace in which the cannon iron was melted, to increase the intensity of pre-manufacturing tests and to conduct post-manufacturing tests. These were empirical rather than scientific in nature. Reconstruction called for the adaptation of more

¹⁷⁴ Joseph Anderson to John Anderson, February 28, 1845. Letter Book, (May 1, 1844 to 1845), p. 243.

advanced technology which created a hotter fire. This was relatively easy compared to the problems of new ordnance tests. For several months following the disaster Joseph Anderson sampled combinations of different kinds of pig iron with various types of coal. The tests included samples of Northern pig as well as that from Western Virginia. Tredegar researchers determined that a combination between Black Heath Richmond coal and Cloverdale iron produced the best results.¹⁷⁵

On the one level, the outcome of these empirical tests provided a solid basis for Tredegar's client's dependence on Cloverdale iron which was unique and lasted until the end of the Civil War. On another level, Joseph R. Anderson attempted to monopolize his brother's output. In the early 1840's Cloverdale was still supplying markets in New York as its predecessor had done under the ownership of the Tayloe family. Disapproving of these outside activities, Joseph Anderson wrote the Cloverdale company as follows:

I have taken some days to reflect on the offer of yours . . . and have concluded to accept your offer of 400 tons iron at \$30- 9 months. . . Yesterday I bought 100 tons iron at \$27 and 100 tons at \$26. I would not be justified by present prices of bar iron in giving you so much, but expect an advance to justify it. It is more than you would get in the Northern Market after the expense of 3 or 4 dollars a ton to get it there .

¹⁷⁵ Bruce, Virginia Iron Manufacture in the Slave Era. p. 193f.

. . . I should not think of shipping your iron to the North at present. It will ruin you.¹⁷⁶

Apparently Joseph Anderson's fears were justified. Not only were Northern founders interested in tapping Cloverdale stock, but so were other Virginia foundries. In particular, the Bellona Foundry, established by Major John Clark in 1816 and located about 13 miles up river from Richmond, attempted to obtain Cloverdale pig for manufacture of its own ordnance. Although the Bellona Foundry never reached the potential that Tredegar did, nonetheless, it was a well-established industry by 1845 and respected throughout Virginia as well as by Federal ordnance agents.¹⁷⁷ Fortunately, the loyalties between Cloverdale and Tredegar were so strong that, Bellona's attempt failed to divert Cloverdale pig. However, loyalties were not strong enough to prevent Tredegar from occasionally asking for higher prices. Very soon "400 tons best Cloverdale iron" was delivered to Tredegar at \$37.50, which was \$7.50 above the sale price of the same iron later in the month.¹⁷⁸

¹⁷⁶ Joseph R. Anderson to John Anderson, May 17, 1844. Letter Book, (May 1, 1844 - November 1845)

¹⁷⁷ Larry J. Daniel & Riley W. Gunter, Confederate Cannon Foundries. (Union City, Tennessee: Pioneer Press, . 1977.) save 21.

¹⁷⁸ Joseph R. Anderson to John Anderson, May 9, 1845. Letter Book, (May 1, 1844 - November 1845).

Although the quality of Cloverdale pig had not been consistent during the early years of operation, decades of experience before 1850 resulted in a successful application of craft techniques, traditional formulas, the intuition of a skilled founder and quality resources. At best, the process was based on empirical research. The source of trouble was the uncertainty of the blast itself, and this was an industry-wide liability, not linked to Cloverdale alone. If the furnace stack was built too tight, it tended to expand and crack. If the bellows did not operate adequately, the desired temperatures could not be reached. Whether related to mechanical problems or climate conditions, situations such as these plagued all furnace operators. Deficiencies of a blast furnace were reflected immediately in the quality of its pig iron. Ironically part of the "400 tons best Cloverdale iron" which was sold at the inflated price of \$37.50, proved to be "of inferior quality." During the "break test" the iron was found to be too weak for casting as cannon. Keeping in mind Joseph R. Anderson's concern over the "disaster of 1843," it is understandable when he declined to accept the thirty-four ton shipment of pig iron because it was "of inferior quality" and would neither be to his advantage or that of

his brother to risk it in cannon.¹⁷⁹ Generously, the Tredegar partner offered to buy Cloverdale's lesser grade pig iron while the firm endeavored to reconstruct its ailing furnace.

During the 1840's Tredegar sought federal contracts in order to achieve economic stability, but not at the expense of business in the private sector. By far the largest iron market at that time was the railroad industry. In the early 1840's, John R. Anderson was assiduous in courting railroad companies for business. Recognizing that it was cheaper to smelt iron with Northern anthracite coal than with Virginia charcoal he feared Northern competitors would gain a foothold in the Old Dominion's market. As a result he was willing sometimes to accept contracts below cost in order to prevent buyers from looking Northward.¹⁸⁰ The pace of Southern railroad construction quickened in the 1850's and Joseph R. Anderson snared, for the Tredegar Works, a great deal of Southern as well as Virginia's business.

The difference between "gun metal" and railroad iron was a matter of both quality and founding technique. Cannon iron had to be of the highest quality. The inside of a

¹⁷⁹ Joseph R. Anderson to John Anderson, June 30, 1845. Letter Book, (May 1, 1844 - November 1845),.

¹⁸⁰ Bruce, Virginia Iron Manufacture in the Slave Era. p. 278.

cannon required a hard consistency which was able to endure sharp explosive charges. The outside of the cannon had to be softer in order to absorb the shock of an explosion. The opposite was true of locomotive wheels. Their interior had to be soft and absorbent under the weight of the train. The outside had to be hard in order to withstand the friction of iron against iron.

Throughout the 1840's, 50's and 60's, and even after the Civil war, Tredegar maintained a good railroad market. Therefore, in addition to seeking quality "gun metal," Anderson also stocked supplies of other types of pig iron. Although it may have been lesser in quality, it was no less marketable and he was eager to buy whatever his brother in Botetourt County, as well as any other Virginia charcoal furnace, could produce.

However, regardless of the association with railroad construction, it was Cloverdale's fine "gun metal" that became crucial to a great deal of both Cloverdale's and Tredegar's success throughout decades preceding the the Civil War. No doubt this preference owed something to kinship, but the basis was not nepotism, it was the need for quality pig with which to cast cannon.¹⁸¹

¹⁸¹ The preference which was expressed by Joseph for the iron made at Cloverdale is reflected in numerous letters addressed to the Botetourt County firm. Particular examples may be found in: Letter Book, (December 3, 1845

Before 1859, Trdegar and all other cannon-makers cast by constructing a clay model, making from it a mold into which the molten iron was poured. Once the iron had cured the barrel and vents were "trued" or bored out with a drill.¹⁸² In 1859, Captain Thomas Jackson Rodman discovered a new technique for casting cannon. At the Fort Pitt Foundry in Pittsburgh, Pennsylvania, he utilized a process whereby it was possible to cast cannon with hollow cores. In so doing, Rodman enabled the founder to cool the inside of the barrel before cooling the outside. The advantage of this was in the increased strength of the inside compared with that of the outside. A stream of water that was passed through the core reduced the inside temperature very quickly creating a "tempering" effect. The cooling of the outside would be prolonged by gradually decreasing the temperature of a heat source coming into contact with it. The finished product would consist of a hard, brittle interior and a soft absorbent exterior.

to May 1, 1847)., Joseph Anderson to John Anderson, July 8 & 22, 1846.

¹⁸² Dennis Diderot, A Diderot Pictorial Encyclopedia of Trades and Industry. ed., by Charles C. Gillispie, New York: Dover Publications. 1959, plates 108 - 114. Ideally bronze was used instead of iron because it did not shatter if it exploded. However, bronze was more expensive and not always affordable.

When the United States Army's Ordnance Department requested Tredegar to use the "Rodman plan" Joseph Anderson refused. As a result the Department began to contract with other foundries which had agreed to make the switch. Anderson attempted to reverse the Federal Government's decision, but to no avail as the "solid cast" method was at best obsolete.¹⁸³

The depressing outlook for Tredegar in 1859 was compounded by the failure to meet a contract deadline with the Virginia State Armory for the production and implementation of musket-making machinery. The contract was a joint venture between Tredegar and a Massachusetts firm whose own musket-making potential was better than Tredegar's. From the start, apprehension on the part of the Virginia General Assembly posed problems for Tredegar. Being close to sectional conflict, they saw such a deal as an unnecessary risk and it was not until a special Armory Commission had thoroughly examined the case, before it was allowed to proceed. When the Civil War broke out, only a portion of the Massachusetts equipment had arrived. In a

¹⁸³ Dew, Ironmaker To the Confederacy. pp. 44-46. Anderson's refusal to utilize the Rodman process was not an isolated case of stubbornness or pride. Many foundries throughout the country, including at the famous West Point Foundry in New York, initially refused the process, not out of contempt or jealousy, but out of the hesitation to switch from an age-old tradition which had proved itself through time.

frenzy of accusations which followed, Joseph R. Anderson felt compelled to defend himself and the Tredegar agents by writing John Letcher, the Governor of Virginia and asserting that the Tredegar Company was dependent on the cooperation of the Massachusetts firm due to the impatience of the Armory officials. Therefore, Tredegar was not to blame for either contracting out of state or the loss of the machinery.¹⁸⁴

In May of 1860, Joseph Anderson seriously considered ceasing ordnance production altogether because John Anderson proposed to abandon Cloverdale and its manufacture of "gun metal" so that he could devote all his time to politics. Joseph Anderson did not press his brother unduly, and eventually the latter reconsidered. Rather than abandoning Cloverdale completely, John Anderson decided to drop the production of the costly "gun metal" in order to focus all his facilities on the production of railroad iron.¹⁸⁵ Joseph Anderson's opinion of this decision is unknown. Presumably, John and the other Cloverdale partners realized that it was better to have a marginally profitable furnace than an abandoned one.

¹⁸⁴ Joseph R. Anderson to Governor John Letcher, esq. Governor of Virginia, June, 17, 1861. Letter Book, (May 1, 1861 - August 24, 1861) pp. 330 - 334.

¹⁸⁵ Dew, Iron Maker to the Confederacy. pp. 48-49.

In the short-run, this attempt to save Cloverdale was futile. Railroad iron could not offset labor and materials costs. After eighteen years of use, much of the local timber had been cut and as a result, John Anderson was forced to acquire new lands or purchase wood from neighboring farms. In either case the strain on capital caused by exhausted resources, had made the manufacturing of pig iron at Cloverdale Number 2, unprofitable and inefficient. In essence, Cloverdale had succumbed to the usual fate of small rural charcoal furnaces everywhere. Without the demand for gun iron at Tredegar, Cloverdale was just another antiquated cold-blast charcoal furnace in the new age of anthracite fueled furnaces.

During the period while Cloverdale was out of blast, John Anderson turned his attention toward his personal ambitions. He served in the House of Delegates as a Representative of Botetourt County for seven terms, three before 1840 and three after 1860.¹⁸⁶ From this position, John Anderson sought to defend the Whig party and with it the security of the "Glorious Union." In the mean time, his brother had become a strict sectionalist and held the opposite view.¹⁸⁷ In some respects it was easier for John

¹⁸⁶ Stoner, A seed-Bed of the Republic. pp. 272 & 438.

¹⁸⁷ Dew, Iron Manufacture to the Confederacy. P. 41.

Anderson to divorce himself from the pressures involved in manufacturing than it was for Joseph R. Anderson. In part this was due to the difference in scale between Tredegar and Cloverdale, but it was also due to the owners' political orientation and commitment. While remaining loyal to the South, John Anderson did not feel compelled to assert Southern independence, whether politically or industrially; Joseph Anderson did and as such, directed a great deal more energy into obtaining these ends than his brother in Botetourt County.

While financial storms battered the Tredegar Company in 1860, the Union was buffeted by sectional passions. In November of 1860, Abraham Lincoln won the election to the Presidency. In December, South Carolina declared herself independent and some of her Southern sisters followed suit. Despite the failure of efforts to mediate the crisis, Virginia led the border states in debate rather than practicing secession. When, on April 13, 1861, hostilities commenced at Fort Sumter and the Lincoln Administration called for troops to end insurrection, Virginia seceded and joined the Southern Republic.¹⁸⁸ Even though at the outset

¹⁸⁸ Clemont Eaton, A History of the Southern Confederacy. New York: The MacMillian Company., 1954 p. 136f. Joseph Anderson was responsible for outfitting much of the South Carolina forces with munitions and ordnance. His commitment to their insured arrival is reflected in his personal supervision of the delivery. During his

neither side expected a long war, each embarked on a tremendous expansion of war-related industries. This was particularly true in regard to ordnance. To improve the Tredegar staff, Anderson recruited several master armorers from the Enfield Works in England.¹⁸⁹

Upon the commencement of hostilities, Joseph Anderson was eager to serve the Confederacy beyond the limits of Tredegar. As a West Point graduate, with political, industrial and administrative experience far above many of the Confederate officers, he was well suited for a provisional command. In requesting such a position Anderson wrote the Confederate Secretary of Defense in August 1861. In the letter, Anderson compared his qualifications to those of three of his West Point classmates who had been appointed brigadier Generals in the Union Army- Montgomery C. Meigs, John W. Phelps and Thomas W. Sherman.¹⁹⁰

stay in Charleston, Anderson managed to spend an evening with his old artillery instructor from West point, Major Robert Anderson the Federal Commander at the soon to be seiged fort. Carles Dew, Iron Maker To the Confederacy. p.73.

¹⁸⁹ George G. Shakelford, "George Wyth Randolph and the Confederate Elites," Unpublished Book, Chaptert III, Department of History, VPI&SU.

¹⁹⁰ Dew, Iron Maker to the Confederacy, p. 95.

The letter was recieved with mixed feelings. The question arose whether Joseph R. Anderson would be more valuable to the Southern Cause in Richmond or in the field. The Confederacy's dependence on Tredegar was not taken lightly and a lengthy debate proceeded on the subject. Fearing a rejection, Anderson wrote another letter, this time to President Davis. Apparently this was a more convincing letter and on September 3, 1861, Joseph R. Anderson was directed to Cape Fear, North Carolina where he would hold the rank of brigadier General in charge of coastal defense.

During Anderson's absence Tredegar was left in the charge of Robert S. Archer and John Tanner. Although each man was well acquainted with the company's manufacture of ordnance and munitions, neither was capable of maintaining the firm control that Anderson had established, and before the year's end, the General had returned from Cape Fear and was once again in charge of his "industrial army."¹⁹¹

Under the Confederate Chief of Ordnance, Colonel Josiah Gorgas the Government assumed more and more of an interest in the company. E. Merton Coulter has called him, "the most successful and able organizer in the Confederacy."¹⁹² It was

¹⁹¹ Ibid p. 96.

¹⁹² E. Merton Coulter, The Confederate States of America, 1861-1865. (Louisiana State University: 1950,) p. 202.

Colonel Gorgas' responsibility to secure and maintain a constant supply of weapons and munitions for the South. His association with Joseph Anderson at West Point and his knowledge of Tredegar's reputation for casting quality ordnance enabled Colonel Gorgas to smoothe out difficulties which otherwise might have hindered the war effort.

The problems involved in gearing industry for war go far beyond the production of weapons. Various support industries were needed to supply peripherals to the soldiers as well as create an economy. This was particularly true in the Confederacy's case. Much of America's industrial element lay north of the Mason-Dixon Line. In order to aid Southern businesses in establishing new industries the Confederate Congress allowed for loans and advances on eventual products. No company was allowed to profit more than 75% at the begining of the war and 35 1/2% later. To insure the compliance with these tenets, regulations were established "refusing to detail workmen and allow transportation facilities to those who would not conform."¹⁹³

As contracts began to build up for cannon, and "gun metal" reserves began to decline, Joseph R. Anderson urged his brother to reopen the Cloverdale Furnace.

¹⁹³ Ibid p. 203.

Unfortunately, Cloverdale was without direction because John Anderson was still practicing politics. In order to resolve this situation, Tredegar's leading partner began searching for founders himself. In late spring of 1861 Joseph Anderson met with the Steers brothers of Allegany County, Virginia. On June 21, Isaac and Thomas Steers made a verbal agreement with Joseph and John Anderson to run the operation for two years.¹⁹⁴

Fearing that the new founders would not uphold the strict guidelines used by John Anderson and Thomas Shanks to make Cloverdale's best iron, Joseph Anderson supplemented the verbal agreement with a letter expressly stating that they produce

"...the same kind of iron, all to be made with cold-blast and charcoal fired and of the ore hitherto used in making cannon iron by John Anderson esq. in an unhumanlike manner, the pigs being properly cleared of sand and to be satisfactory to us."¹⁹⁵

Apparently reinstituting the blast was not easy, and for two months Joseph kept up this correspondence hoping for word on any progress. Finally, when he could hold out no longer he wrote:

¹⁹⁴ Dew, Iron Maker to the Confederacy. p. 102.

¹⁹⁵ Joseph R. Anderson to Thomas and Isaac Steers, June 25, 1861. Letter Book, (May 1, 1861 - August 24, 1861).

Are you putting either furnace in blast? Let us know exactly what offers you accept for your iron. We can not wait any longer. Must make other arrangements if you are not getting on.¹⁹⁶

As Table 8 shows, although Virginia was second to Tennessee in pig iron production during 1860, the Old Dominion was first in production of cannon. Of the total 2093 guns made by the various Confederate foundries, 1043 were cast at Tredegar.¹⁹⁷ Through observation of these statistics it becomes clear just how much the Confederacy depended on Tredegar's operation. The defense of Richmond was not only the defense of the Confederate Capital, but also the protection against losing the South's most valuable cannon foundry.

The pressure which Joseph Anderson felt to produce cannon at Tredegar was passed on to the Steers brothers at Cloverdale. Full production at Tredegar once again became dependent on supplies from Botetourt. In a similar attitude which he had taken during the 1840's, Joseph Anderson increased his correspondence with Cloverdale's operators in hopes of stimulating more production. In reply Tredegar recieved little of any type of iron.¹⁹⁸

¹⁹⁶ Joseph R. Anderson to Isaac and Thomas Steers, May 25, 1861. Letter Book, (May 1, 1861 - August 24, 1861)

¹⁹⁷ Larry J. Daniel & Riley W. Gunter, Confederate Cannon Foundries. Union City, Tennessee: Pioneer Press,. 1979 p. 93.

TABLE 8

Production Statistics of Confederate Pig Iron and Cannon

State	Tons of Pig Iron Produced in 1860
Virginia	11,646
Georgia	1,100
Alabama	1,742
Tennessee	22,302

Foundry	State	Total Cannon Produced
Tredegar	Virginia	1043
Naval Gun Fundry	Alabama	153
Augusta Arsenal	Georgia	130
Quinby & Robinson	Tennessee	100
John Clark & Co.	Louisiana	100
Noble Bros. & Co.	Georgia	85
T.M. Brennan & Co.	Tennessee	83
Macon Arsenal	Georgia	80
Leeds & Co.	Louisiana	65
A.B. Reading & Bro.	Mississippi	45

Sources: Larry J. Daniel & Riley W. Gunter, Confederate Cannon Foundries. p. 93, Eighth Census of United States Manufacturers 1860.

Charles Dew, Iron Maker to the Confederacy. p. 88.

When under pressure from Colonel Gorgas, Joseph investigated the situation, he found that the reason for delayed shipments was due to the Steers brothers selling their iron on the open market.¹⁹⁹ As a result of the restriction and profit limits imposed by the Confederate Government, Many businesses saw Government contracts as undesirable.²⁰⁰ Quite simply, the degree to which Isaac and Thomas Steers belived in the cause of the Southern States was not enough to overcome their desire to become wealthy. Profiteering is often an outcome of war and it is not suprising that Cloverdale did not escape association with it.

Little satisfaction was gained through the efforts of both the Ordnance Department or Tredegar. Only small shipments of iron reached Richmond before the end of the year.²⁰¹ It became clear to Anderson that in order to insure the production and delivery of Cloverdale iron, it was

¹⁹⁸ Anderson wrote: "We regret that as yet we have heard of no shipment of iron from the Cloverdale. We can cut no more guns until we get it and must beg you ship at once, all you can possibly have ready. We are much concerned for this delay." Joseph R. Anderson to Isaac and Thomans Steers, Fall 1861. Letter Book, (August 24, 1861 - December 1, 1861) p. 159.

¹⁹⁹ Dew, Iron Maker to the Confederacy. p.134.

²⁰⁰ E. Merton Coulter, The Confederate States of America, 1861-1865. p.204.

²⁰¹ Dew, Iron Maker to the Confederacy. p. 135.

necessary to buy the furnace from Anderson, Shanks and Anderson. After establishing a guaranteed contract with the Confederate Government for the annual production of \$2,000,000 worth of ammunition and guns, Joseph Anderson convinced the War Department to advance him \$300,000 as capital needed to buy selected valley furnaces, including Grace and Cloverdale.²⁰²

The Tredegar Iron Works acquired other western Virginia furnaces: Glenwood, Columbia, Catawba, Jane and Rebecca. Of the total, only four were operational. Catawba, Jane and Rebecca had to be completely rebuilt, while Cloverdale, Glenwood, Columbia and Grace just needed shaping up.²⁰³

The renewed enthusiasm brought new life to Cloverdale, but it was short lived. Although shipments of "gun metal" began to take on more of a routine pattern, the pattern was never regular enough to please those waiting in Richmond. Renewed enthusiasm was not enough. What had been taken from nature could not be restored with high ideas and good intentions. The once vast reserves of timber had dwindled to scrub brush and saplings. Charcoal had to be transported great distances over rough roads and because of such problems, the furnace went out of blast on several

²⁰² Ibid, p. 148.

²⁰³ Ibid, p. 153.

occasions. One such instance is expressed in the a letter from Joseph Anderson to Cloverdale.

I found on Saturday that Cloverdale Furnace had gone out of blast. They were on running stock and the road became so bad they ran out of coal. They will put in a new hearth tonight to light up again in about six weeks if the weather is favorable.²⁰⁴

In addition to the depletion of local resources, Cloverdale and Grace furnaces were compelled to share the same founder. After the Steers brothers left, Joseph Anderson's valley furnace agent, Francis Thomas Glasgow found it extremely difficult to locate a replacement. No longer was it possible for Southern iron furnace owners to advertise in the North for employees. The war had seen to this end, and as a result, Cloverdale and Grace production was limited by default.

In June of 1864, Tredegar was faced with one of the biggest disasters in its history. In that month, the Union's Major-General in command of the Department of West Virginia, David Hunter, established a raiding party for the purpose of capturing and destroying Shanandoah Valley railroad lines.²⁰⁵ Brigadier-General William W. Averell was

²⁰⁴ F.T. Glasgow to Joseph R. Anderson, Febuary 3, 1863. Furnace Letter Book, 1863.

²⁰⁵ Reports of Brigadier-General Alfred N. Duffie U.S.A Commanding First Cavalry Division, July 9, 1864. War of the Rebellion: Official Records, Ser. I, Vol. 37. p. 94ff.

in command of the Second Cavalry Division. While sweeping through the area of Fincastle, Averell discovered the Mount Tory, Cloverdale and Grace furnaces. Apparently, he did not recognize the importance which lay behind these furnaces and in particular the relationship between Tredegar and Cloverdale "gun metal." After taking what he could, Averell burned the furnaces and departed, taking with him any of the black employees that would go.²⁰⁶

Mount Tory was completely destroyed and never rebuilt. Cloverdale and Grace were burned severely, but both were salvageable. In hopes of eliminating any more slack in production, Joseph Anderson began rebuilding the furnace at once. In a letter to his brother, John Anderson, the Tredegar partner displayed a patient, but insistent attitude toward the furnace's reconstruction.

It dawns to us that it would be better to use what "Cloverdale & Grace" iron remaining on hand as we hope before a great while to have the new blast particular by the furnace.²⁰⁷

Although Cloverdale was rebuilt, production never reached the degree expected by Joseph Anderson and the Confederate Ordnance Bureau. Throughout the remainder of

²⁰⁶ Bruce, Virginia Iron Manufacture in the Slave Era. p. 417.

²⁰⁷ Joseph R. Anderson to J. Miller Dover, January 10, 1865. Letter Book, (December 7, 1864 - February 14, 1865)

the war authorities in Richmond expressed great concern over this dilemma, but were unable to contribute to its solution. The furnace went out of blast shortly after the war's end and never produced iron again.

Chapter IX

CLOVERDALE'S FINAL YEARS

In the decades following the Civil War, anthracite fuel replaced charcoal in most of the United States iron industry. In part this was due to the improvement of transportation lines which opened, the hitherto inaccessible coal fields of Western Pennsylvania, Virginia, and Tennessee, but it was also a maturation of industrial centralization and expansion. As foundries increased in size and production, they became more and more dependent on reliable fuel reserves. America's coalfields could meet these needs, but the forests could not.

In Nineteenth Century America, wood was a valuable material. Not only did it provide fuel for industry and home, but it was often the material used in construction. In areas of increasing population and urbanization, timber reserves were exploited to the point of minimal, if any, reproduction. To offset depleted supplies, it became necessary to import timber from distant logging camps where immigrant labor could help minimize overhead expenses. This was practical for construction work which had little alternative, but not for industry. Although not quite as efficient as charcoal, anthracite coal was abundant and cheap.

By the last quarter of the Nineteenth Century, charcoal making had become capital intensive. Retorts, Kilns and cast iron stacks were needed to produce enough fuel to make the effort worthwhile, and even then it was not profitable. The profit that was made, came from sales of the by-products which were extracted during the carbonization process and not from iron sales.²⁰⁸

In 1789, small, rural charcoal iron furnaces were making approximately 28 tons of pig iron in a week. This stage of colonial production represented the first of three phases in United States charcoal iron manufacturing. The techniques were based on tradition and experience which had changed little since Braintree and Saugus. The second phase appeared by the mid 1800's and was characterized by the hot-blast process. Average furnaces of this period were capable of producing 150 tons of pig iron per week. Also during the second phase, came a change in furnace height. It was discovered that a taller stack produced a hotter blast and a more efficient output. However, only during the third phase was this furnace-height to temperature ratio maximized and as Table 9 shows, by the late 19th Century, furnaces stood in excess of sixty feet high.

²⁰⁸ Shallenberg, Evolution, Adaptation and Survival: the Very Slow Death of the American Iron Industry. p. 341-358.

TABLE 9

Charcoal Iron Furnace Heights, 1780 - 1920

<u>Date</u>	<u>Height in Feet</u>
1780	25 - 32
1800	25 - 34
1820	25 - 35
1840	30 - 35
1860	30 - 38
1880	40 - 50
1900	56 - 60
1920	60 - 65

Source: Schallenberg, Richard H. "Technological Innovations in the American Charcoal Iron Industry, 1830 - 1930," Unpublished Thesis, Department of History, Polytechnic Institute of Brooklyn, Brooklyn, New York. p. 100.

Obviously, the third and final phase of America's charcoal iron industry was the most productive. Whether this was true financially as well as productively, is not known, but it is clear that this phase represented the limit of charcoal iron manufacturing. Not only was anthracite coal replacing charcoal, but steel was replacing iron. It was in this context that Cloverdale iron met its end.

As Table 10 illustrates, by the second half of the 1800's, no longer was the Old Dominion a major iron producing state. Virginia's iron industry had not benefited from technological advances as had Michigan, Pennsylvania, Alabama and New York, and as a result, her charcoal furnaces remained subject to phase I and phase II techniques. Temporary relief came during the Civil War when all types of iron were in demand, but while the South relied heavily on charcoal iron during the conflict, the same was not true of the North. Above the Mason Dixon Line, Yankee capitalists used war demands as an opportunity to expand their industries and switch from charcoal to coal. After the war it was a natural step for the cheaper Northern iron to dominate the market and force the marginal Southern furnaces out of business. This held true for Tredegar and by 1866, Joseph R. Anderson began questioning the economy of his valley furnaces.

TABLE & STATE IRON PRODUCTION IN 1889

<u>State</u>	<u>Production</u>
Alabama	1,570,319
Georgia & N. Carolina	258,145
Michigan	5,856,169
Minnesota	864,508
New Jersey	415,510
New York	1,247,537
Pennsylvania	1,560,234
Tennessee	473,294
Virginia & W. Virginia	511,255
Wisconsin	837,399

Sources: James Swank. History of the Manufacture of Iron in all Ages, | New York: Burt Franklin Reprint, (1892). p. 516

At first, he thought of converting them to coal in hopes of maintaining some type of profit, but after careful consideration the idea was discarded in favor of selling them.²⁰⁹ The first place he turned to was the North hoping that the same manufacturers which had expanded their industries during the war would be interested in spreading their business in the South. Unfortunately for both Tredegar and Cloverdale, no buyer was found and for the next eight years the furnace stood abandoned.

During these eight years it became necessary for Joseph Anderson to sell small portions of the Cloverdale tract in order to pay the land taxes.²¹⁰ However, unable to sell the entire furnace property, Joseph Anderson turned to other means of securing a profit from the establishment. Throughout the 1870's and 1880's, he negotiated with various Roanoke iron and manganese companies over the possibility of reinstating the ore mines, if not the furnace itself.²¹¹ In October of 1883, one such attempt was highlighted by a feasibility study conducted by two Washington and Lee

²⁰⁹ Dew, Iron Maker to the Confederacy, p. 305.

²¹⁰ Several deeds of these sales survive in the Botetourt County Records at Fincastle Courthouse in Fincastle, Virginia. 1863 - 1889. Deed Book # 35 p. 308., Deed Book # 40 pp. 24, 221, 284., Deed Book # 41 p. 314, 493, 547., Deed Book # 43 p. 60,

²¹¹ Fincastle Herald, (April 6, 1893). found in Botetourt County History Before 1900, p. 72

University Professors. In summary they wrote:

The simplicity of its topography, which gives such easy access to the ore, and a somewhat uniform down grade for roads of any kind that may be made to them; the quantity and quality of the ores found on it; the nearness of the Shenandoah Valley Railroad, and the facility with which ores can be mined and brought to it, give this property a value which but others possess.²¹²

Although no immediate results were obtained in connection with the study, eventually the effort paid off. Six years later, on August 15, 1889, B.C. Rawlings, J.W. Arventrout and Z.H. Rawlings of Roanoke, signed a contract with Joseph Anderson giving them the right to mine Cloverdale's iron ore at 25 cents per ton and manganese at \$1 per ton, but not to exceed 100 tons per day.²¹³ Although it was not operating as a furnace, at least it was profitable and continued to do so, well into the 1890's.

Industrial centralization, expansion and improved technology had won over the traditional craft techniques of charcoal iron furnaces. Not even the Cloverdale reputation was a match for such overwhelming odds and once the mining ceased, 100 years of iron making faded into the past, soon to be followed by the charcoal iron industry itself.

²¹² J.L. Campbell, and Harry, D. Campbell. Report of the Cloverdale Iron Property. | Washington and Lee University: 1883.

²¹³ Botetourt County Deed Book, # 45, p. 543.

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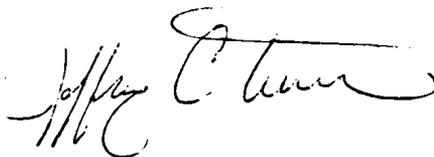
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VITA

Jeffrey Clayton Turner, the son of Colonel and Mrs. Robert C. Turner, was born on October 27, 1958 in Galesburg, Illinois. As a military dependent, his childhood and adolescent years were spent on various Army Posts throughout the United States and Belgium. The writer received his secondary education in Newville, Pennsylvania and upon graduation in 1977, entered Juniata College in Huntingdon, Pennsylvania. After receiving a B.S. degree in Religion and Education, he worked for a year as a carpenter. His postgraduate studies at Virginia Polytechnic Institute and State University, began in 1982 and culminated in 1984 with a M.S. degree in History.

A handwritten signature in cursive script, appearing to read "Jeffrey C. Turner". The signature is written in dark ink and is positioned below the main text of the vita.

Cloverdale Furnace: A Century of Iron Manufacture in
Botetourt, County
Virginia, 1789 - 1889

by

Jeffrey C. Turner

(Abstract)

In an effort to answer broad, contextual questions concerning early 19th Century American industrial history, it is often necessary to supplement generally accepted premises with observations of particular instances. This study of Cloverdale Furnace constitutes such an observation. Particular attention has been paid to details of person, place and practice as gained from Botetourt County Records and the correspondence between such furnace owners as the Breckenridge, Tayloe and Anderson families.

The ultimate fate of charcoal-fired iron furnaces is so well known as to require little or no comment. That Cloverdale continued into, and beyond the period of the United States Civil War, depended upon a variety of causes. It probably would have ceased operation in 1859 - 1860, but for crisis of the Union. Other causes for Cloverdale's success and perseverance included: availability of capital, labor, raw materials and managerial talent. Not all of these were distinctive, but some were enough so to deserve special note.

The study is chronologic. It begins with the establishment of the furnace in 1789, and ends with the final mining activity of 1889. During this period, there were two separate furnaces located within eight miles of each other. Each was named Cloverdale and each produced high grade charcoal-smelted "gun metal." The operation of Cloverdale Number 1 was based on craft techniques and linked to a local market. The owners were largely absentee investors who utilized their existing slave force for labor. Cloverdale Number 2 was based on a regional market and incorporated a more advanced technology in furnace construction. Under the ownership of John T. Anderson, and later, Joseph R. Anderson, Cloverdale Number 2 achieved a reputation second to none in the eastern part of the United states for producing quality "gun metal" and supplied the Tredegar Works in Richmond with the same. Unfortunatly, the reputation was not enough to protect the firm from collapse due to depleted timber reserves and natural resources.