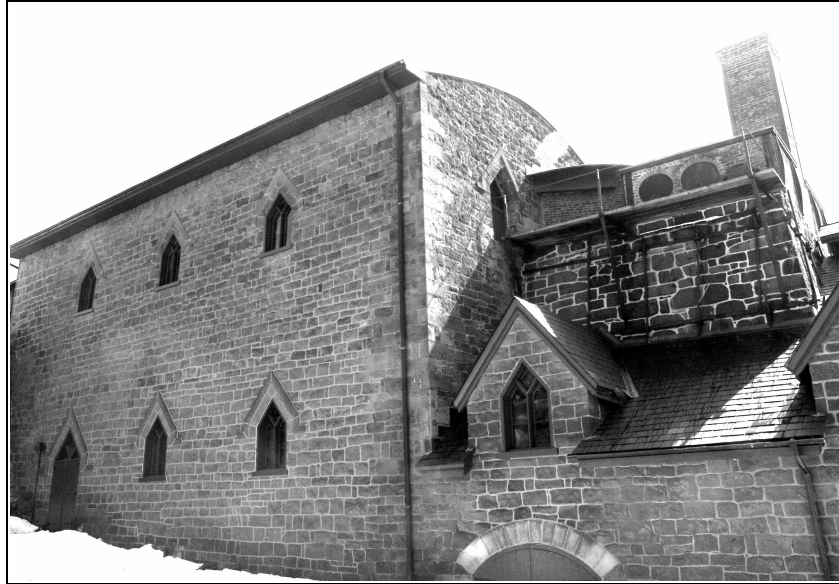


**CORNWALL FURNACE ARCHIVAL SURVEY AND  
RESEARCH ACTION PLAN**

**JULY 2007**



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## Descriptions of Major Collections Surveyed<sup>1</sup>

### **MG-346: Cornwall Furnace and Hopewell Forge Account Books, 1752-1766:**

Contains account books documenting the operations of Cornwall Furnace and Cornwall Forge and Hopewell Forge near Pottstown. A large sandstone blast furnace was first erected by Peter Grubb at Cornwall about 1739 in order to supply Hopewell Forge with pig iron. By 1790 the operations at both locations gradually came under the control of Robert Coleman who obtained full ownership by 1803. Cornwall Furnace remained in operation until 1883 and was owned by the Coleman estate until 1932 when it was donated to the Commonwealth of Pennsylvania.

The account books are associated with the Grubb period of ownership. Hopewell Forge is represented by journals and ledgers covering the period 1753-66 and Cornwall Furnace is represented by journals and ledgers for the years 1752-66. These account books were in the possession of the Maryland Hall of Records as a result of a court case, Amos Garrett vs. Jacob Giles, filed Dec. 2, 1771 with the Maryland Court of Chancery. A full transcript of this case appears in the Maryland Court of Appeals (Judgment Records) BW10, p. 45-346.

### **MG-203: Cornwall Furnace Collection:**

Consists primarily of account books, 1768-1892, 27 vols., of or pertaining to Cornwall Furnace and several other furnaces and forges, including Charming Forge, Colebrook Furnace, Hellem (Helmstead) Forge, Hopewell Forge, Speedwell Forge, and Spring Forge. Included is a letter book, 1879-80, of A. Wilhelm, attorney for R. W. Coleman's Heirs and Company; a brief of title to the Cornwall Ore Banks and Mine Hills, 1932 (photostat); blueprints (includes layout of Bethlehem Iron Company property in south Bethlehem, 1901); and specifications for a proposed music hall for Cornwall, Pennsylvania, to be built by Robert H. Coleman.

Erected by Peter Grubb in 1742, Cornwall Furnace came under the control of Robert Coleman in 1798 and remained within the Coleman family until 1932, when the property was donated to the Commonwealth.

### **MG-182: Lebanon County Historical Society Deposit of Manuscript Collections:**

34 separate collections pertaining mainly to the history of Lebanon County, most prominent of which both in size, 174 cu. ft., and importance is the Coleman Collection.

This collection consists primarily of business records of the iron furnaces and ore hills operated by members of the Coleman family of Lebanon County, which figured very prominently in the eighteenth-century and nineteenth-century history of the iron industry in the United States. The first Coleman to become involved in the industry was Robert Coleman (b. 1748, d. 1825), who came to Pennsylvania from Ireland around 1764. He was employed by Peter Grubb at Hopewell Forge and by James Old at Speedwell Forge and Reading Furnace. In 1773 he married Anne

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<sup>1</sup> Collection descriptions borrowed from <http://www.phmc.state.pa.us/bah/dam/mg/index.htm>

Old, daughter of James Old, and for the next three years rented Salford Forge near Norristown. He rented Elizabeth Furnace in 1776, living there until his retirement in 1809, whereupon he took up residence in Lancaster. Robert Coleman served as an officer in the Pennsylvania Militia during the Revolutionary War and was a member of the state convention which framed the Constitution of 1790. He was a member of the legislature, a delegate to the convention to ratify the federal constitution, twice a presidential elector, and an associate judge for Lancaster County.

The collection contains minutes, reports, letterpress books, correspondence, legal papers, photographs, numerous accounts (blast books, cash books, coal and coke books, day books, freight books, journals, ledgers, order books, ore books, pay roll books, pig iron books, time books, etc.), and various other series. It is divided into the following sub-groups: Robert Coleman and Heirs, 1757-1859; R. W. & W. Coleman, 1821-80; R. W. Coleman and Company, 1849-68; R. W. Coleman's Heirs and Company, 1849-93; Robert H. Coleman, 1850-1900; Lebanon Furnaces, 1857-1900; Cornwall Ore Bank Company, 1863-1916; Sarah H. Coleman, 1866-1902; North Cornwall Furnace, 1871-1901; Freeman, Coleman, and Buckingham, 1871-1940; and Robeson Iron Company, Ltd., 1885-1927.

#### **MG-409: Oral History Collection, 1970-1990:**

The Oral History Collection consists of taped interviews conducted throughout the Commonwealth of Pennsylvania by staff members and Friends of the Pennsylvania Historical and Museum Commission. These interviews shed light on the common folk and their backgrounds as southern born African American migrants, European immigrants, Hispanics, Jews working in the coal, steel, and electrical industries. Interviewing projects include the following:

Cornwall Oral History Project, 1980-1982 (41 tapes; 25 interviews; 45 hours) Documents lives of people who worked in the iron mines and ore processing plant operated until 1972 by Bethlehem Steel. Includes interviews with workers, managers, and wives.

#### **MG-23: Arthur C. Bining Papers:**

Notes, photographs, clippings, and bibliographical references used by Arthur C. Bining in the preparation of various of his books and articles relating to the development of the iron and steel industry. Manuscripts of some of Bining's writings, such as *Pennsylvania Iron Manufacture in the Eighteenth Century*, are included, as are letters from George W. Schultz and Frank W. Melvin. Photographs are of numerous forges and furnaces (Cornwall Furnace) and of various facilities and operations of iron and steel companies (Bethlehem Steel Company, Carnegie Steel Company, and Robeson Iron Company, Ltd.).

#### **RG-13: Records of the Pennsylvania Historical and Museum Commission:**

The Pennsylvania Historical and Museum Commission was created in 1945 to consolidate the functions of the Pennsylvania Historical Commission, the State Museum and the State Archives. Charged with the responsibility of preserving the Commonwealth's historic heritage, the Commission administers the state archival and records management program and numerous museums and historical sites. The Commission also assists local historical societies and

governmental agencies in all matters regarding historical preservation, conducts research and publication programs to promote Pennsylvania history, and manages the State Records Center. The Commission operates through its Bureau of Archives and History, Bureau of Museums, Bureau of Historic Sites and Properties, and Bureau of Historic Preservation.

The State Archives was originally created as the Division of Public Records in 1903 as an administrative unit in the State Library. A State Museum was also created under the State Library in accordance with legislation passed in 1905. As part of a general reorganization in 1919, the State Library became the State Library and Museum. In 1923 the State Library and Museum was made an administrative unit of the Department of Public Instruction as was the Pennsylvania Historical Commission, which had functioned as an independent commission since its establishment in 1913. Under the Department of Public Instruction, the State Library and Museum worked through five sections: the General Library, Law Library, Library Extension, Archives and History, and the State Museum.

**MG 219: Philadelphia Commercial Museum Photographic Collection:**

Photographic files of the Philadelphia Commercial Museum, which was founded in 1894 to promote American and foreign commerce and to collect information concerning the products of world trade. The name of the museum was changed in 1966 to the Museum of the Philadelphia Civic Center. Photographic files, arranged by counties and by subjects, include these major categories: Pennsylvania scenes; Philadelphia scenes; American Indians; agriculture; educational institutions (Carlisle Indian School, Dickinson College, Swarthmore College, University of Pennsylvania, etc.); industry (airplane, aluminum, automobile, brick, cement, clothing, coal, electric, fur, gas, glass, iron and steel, lumber, mining, paper, petroleum, pottery, printing, radio, railroad, rubber, shipbuilding, street car, telephone, etc.); natural science (birds, fish, wild life, etc.); and transportation (air, canal, coach and wagon, mail, railroad, river, sailboat, steamship, etc.).

## **Theme 1 Overview: Cornwall Iron Furnace's Physical Infrastructure:**

Cornwall Iron Furnace is believed to be the only intact cold blast charcoal furnace in the Western hemisphere.<sup>2</sup> While this statement is materially true, a looser definition of “intact” would complicate this interpretation. It is also unclear whether this qualitative distinction will have any bearing on the site's visibility. While this distinction may appeal to a well-informed audience or special interest group with above-average contextual knowledge of regional ironmaking, the site's “intactness” compared to Pennsylvania and regional furnaces may not directly enhance patrons' visitation experience.

An informal survey of extant coal blast charcoal furnaces reveals that no other late-18th and 19th century furnace—and especially furnace shed—in the United States exists in better condition than Cornwall. While some sites like the cold blast charcoal furnace and bloomery forge at Clintonville, New York on the Ausable River operated on a larger scale, producing 2,200 tons of market iron annually in the 1840s, most of this site has been abandoned and no physical remains exist.<sup>3</sup> Other sites and historical districts have claimed high levels of intactness yet no other American furnace still possesses an original enclosed furnace stack. A 1978 National Historic District application for the Cumberland Gap Historical District lists as part of its cultural inventory a furnace “...considered one of the last examples of a cold-blast charcoal furnace” though this furnace is not enclosed and the stack is moderately dilapidated.<sup>4</sup> Both the Franconia Furnace in New Hampshire and the Victory Furnace in Venango County, Pennsylvania possess well preserved stacks, the former built in a distinctive octagonal shape. The stack of the Maramec Iron Works in eastern Missouri exists within the

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<sup>2</sup> *Cornwall Iron Furnace Interpretive Plan*, (West Chester, PA: Interpretive Solutions, 2006), 30. Hereafter, *IP*.

<sup>3</sup> Gordon C. Pollard and Haagen D. Klaus, “A Large Business: The Clintonville Site, Resources, and Scale at Adirondack Bloomery Forges,” *IA, Journal of the Society for Industrial Archaeology*, Vol. 30, No. 1. The anthropology department of SUNY-Plattsburgh has excavated portions of the site. Photos and maps of their findings are available at their Clintonville Forge Project Virtual Tour,

<sup>4</sup> *Cumberland Gap Historic District Nomination Form*, 1980, p. 5.  
[http://www.dhr.virginia.gov/register/Counties/Lee/052-0017\\_Cumberland\\_Gap\\_Historic\\_District\\_1980\\_Final\\_Nomination.pdf](http://www.dhr.virginia.gov/register/Counties/Lee/052-0017_Cumberland_Gap_Historic_District_1980_Final_Nomination.pdf)

boundaries of a park operated by the James Foundation and is reputed to be the first commercially successful iron works west of the Mississippi. Yet while the stack of the Maramec site is well preserved and marginally interpreted, it does not possess the complex of supporting structures and appurtenances found at Cornwall.<sup>5</sup>

Two interpreted cold blast charcoal furnaces approach the diversity of architectural/cultural features of Cornwall. Unlike the fully-restored Hopewell Furnace in Berks county, the cold blast charcoal ironmaking community at Batsto Village situated near Hammonton, N.J. in the Wharton State Forest does comprise 19th century agricultural buildings, coal production and storage facilities, gristmill, sawmill, and blacksmith shops in addition to an ironmaster's house built in an Italianate style. Similarly the Principio Furnace located in Perryville, Md. possesses well-preserved blast engines, fuel storage facilities, and a stylized office structure. According to a cultural landscape study of the site drafted by the Institute for the History of Technology and Industrial Archeology, Principio's 1837 charcoal furnace, as well as its hot blast stove "both still have a high degree of integrity." Perhaps erroneously, the report asserts that Principio's water powered turbine and blowing engines are the only known artifacts still in place. Principio also boasts a brick beehive charcoal kiln, "one of only two of this type still intact in the U.S." and the site also contains a two-story company office building built in the French Second Empire style dating from ca. 1877-1880.<sup>6</sup>

The scarcity of Gothic industrial structures in the United States and England makes the 1840s alterations to Cornwall's casting shed, stack house, charcoal house, and abattoir truly distinctive in Anglo-American architectural history. According to historian Edgar Jones, well-entrenched dictates of taste and the Gothic style's practical limitations prevented the style from becoming a popular industrial idiom. The popularity of English Gothic is attributable to the efforts of A.W.N Pugin (1812-1852), an

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5 Stephen Ludwig, "Maramec Iron Works," *Bittersweet* Volume V, No. 2, 1977.

6 Institute for the History of Technology and Industrial Archaeology, *Principio Furnace Research and Management Plan* (Crownsville, Md.: Maryland Historical Trust, 1998), 22.

English architect and theorist who suggested the Gothic style was an effective Christian antidote to an increasingly secular and industrial world. Avidly encouraging its use, he restricted the style to ecclesiastical and collegiate structures.<sup>7</sup> Though his theory of the Christian value of Gothic was rooted in reminiscence and nostalgia, by the 1840s British architects were adapting Gothic style to modern railway infrastructure. Yet the style was ill-suited to textile buildings and ironworks owing to these structures' functional needs and the limitations of the Gothic.<sup>8</sup> Researchers should pay special attention to the Gothic style's appearance regionally in industrial contexts.<sup>9</sup>

The exact connection of the Cornwall Iron Plantation to these larger transatlantic trends and currents in industrial architecture are unclear. While the ledger journals of MG-346 clearly show Robert Coleman routinely making transatlantic trips and the company store stocked with European wares, it is obvious that the Gothic alterations to Cornwall's structures occurred under Robert W. and William Coleman's expansion of most of their holdings. To corroborate Susan Dieffenbach's dating of the construction of Cornwall Anthracite in 1849, a time book for the anthracite furnace spanning 1848-1861 located in MG-182 mentions that in July and August 1848 “masons commencing quarrying stone for furnace” and further “commence at furnace seat.”<sup>10</sup> Since these are time books, the amount of work, the pay, and job classification of each named laborer involved in the construction is listed in this time book.

Since it is probable that the modifications to Cornwall Furnace occurred at roughly the same time, researchers should identify indexes, journals, memorandum books, and time books that span the years 1840-1855 to better understand this period of expansion. Researchers should take interest in the

7 Edgar Jones, *Industrial Architecture in Britain: 1750-1939*, (New York: Facts on File Publications, 1985), 112-114.

8 Ibid., 119. Although examples such as I.K. Brunel's train shed and offices at Bristol Temple Meads showed the Gothic style's ability to create large functional nave-like central spaces, Jones argues that most industrialists employed the Italian Revival since its massed symmetry lent itself to the boxy industrial structures of the early 19th century.

9 Regionally, the only other complex of industrial structures designed in the Gothic revival was the Point Breeze Gasworks on the Schuylkill River in Philadelphia. The Gas Works buildings were designed by engineer John Cresson and constructed in 1851. See, “The Point Breeze Gas Works: Archaeology without Digging,” in *The Buried Past: An Archaeological History of Philadelphia*, eds. John Cotter, Daniel Roberts, Michael Parrington, (Philadelphia: University of Pennsylvania Press, 1993), pp. 312-316.

10 MG-182, “Time Book, 1848-1861” Cornwall Anthracite, Oversized, Slot Location: 17-1884.

brief notations accompanying workers' time logs.<sup>11</sup> In regard to MG-182 the letterpress books from Cornwall Furnace spanning the years 1840-1850 should be closely scanned for mention of an architect or master craftsman, to designs, costs, workers, or preference for Gothic style. Because of a scarcity of personal documentation relating to the tastes, styles, and travel patterns of Robert W. and William Coleman, it is unclear where the Coleman's acquired an appreciation for the revival nor is it clear what motivated their choice to design and build in the Gothic style. As alluded to earlier, Gothic revival became the choice style of retrogressive elites looking to find stability in a mythologized Christian medieval past.<sup>12</sup> While no confirmation exists that the Coleman's use of Gothic represented a desire to create an American facsimile of a harmonious medieval village, it is clear from a cursory analysis of structures built around the Cornwall/Coleman cultural domain<sup>13</sup> that Robert W. and William and later Robert Habersham Coleman developed an appreciation for architectural consistency and coherence between industrial, social, and religious buildings.

### **Cornwall Furnace's Physical Infrastructure Research Action Plan:**

1.) Whether Cornwall Furnace exists as the only intact furnace in the Western Hemisphere is not addressed in the historical documentation surveyed at the Pennsylvania State Archives nor is this issue discussed in the internal files of the Pennsylvania Historical and Museum Commission (RG-13). Successfully answering this question will require the development of a clearer definition of “intactness” and a differentiation between the qualitative terms like “most intact” and “best preserved” and “finest example” based on historic preservation best practices.

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11 The individual indexes, journals, memorandum books, miscellaneous account books, and time books found in MG-182, slot locations 17-1850,17-1870,17-1886, 17-1884, 6-3161 should be studied in relation to the question of dating the Cornwall Furnace Gothic alterations.

12 Alice P. Kenny and Leslie J. Workman, “Ruins, Romance and Reality: Medievalism in Anglo-American Imagination and Taste, 1750-1840, *The Winterthur Portfolio*, 1975.

13 The area comprising the towns of Anthracite, Burd Coleman, Cornwall Center, Karinchville, Miners Village, North Cornwall, Paradise, and Rexmont.



Researchers should solicit statements from preservation staff at Principio, Hopewell, Batsto, Saugus and others to establish a rubric for determining “intactness”. The online resource *The Pennsylvania Iron Furnace Sourcebook*, though sometimes limited in its accuracy, is the most comprehensive compendium of defunct furnaces in the state and a good point of departure.

**2.-3.)** As suggested above, the significance of the site is rooted in its rare and distinctive Gothic revival styling. Researchers should conduct an empirical examination of the incidence of Gothic revival idiom in industrial contexts in the United States. As suggested earlier, for the purposes of answering this question researchers should confine their review to MG-182, especially those materials spanning the years 1840-1850, or while the furnace was under the control of R.W. & W. Coleman, R.W. Coleman & Co., R.W. Coleman's Heirs & Co. This is roughly the first half of MG-182. In reviewing MG-182, researchers are cautioned to restrict their review to materials relevant to the construction of Cornwall Furnace and to be aware of confusing the charcoal furnace with Cornwall Anthracite. Also, letterpress books and general correspondence are preferable to cash, account, and bill books, though time books do often possess notations as to the nature of work performed. Most nineteenth century account books, being a descendant of an 18th century record-keeping system normally detail the personal debts and credits of individual workers and do not contain records of corporate disbursements. Most of the general correspondence appearing in letterpress books noted “Cabeen & Co.” consists of communication between R.W. Coleman and his sales agent in Philadelphia who sold raw pig or iron billets to other furnaces and mills for reheating. Though the bulk of these letters address normal issues between a supplier and sales agent (prices, maintaining inventory, spike in demand, underselling by competitors) some of these letters do deal with mechanical improvements to the charcoal furnace.

4.-5.) Based on the notations appearing in the aforementioned 1848 time book, the workers who improved Cornwall Anthracite are noted by name. Researchers should closely scrutinize the “Cornwall Furnace Journals, 1848-1868 (A)” located in slot location **17-1850** to identify if similar similar records were kept for work done on the charcoal furnace. The three (3) volumes from MG-182 marked “Indices, n.d. 1846-1849” (an oversized ledger from Cornwall Furnace) in slot location **17-1849** and the “Bills and Receipts Books, 1848-50, incl: misc. accounts and related correspondence” located in slot location 17-1884 may yield information about building materials, type of stone, or pay to workers/craftsmen working on improvements to the charcoal furnace.

6.) Generally, the Pennsylvania State Archives' map collection (MG-11) does not contain 18th or 19th century maps of sufficient detail to determine the disposition of area structures and their change over time. Within MG-11's subheading II. *Counties*, an early map of Dauphin county exists but its detail is poor. Researchers are cautioned that within MG-11, subheading III. *Townships*, the map labeled “Plan of Property-Coleman's” does not cover the Cornwall Borough vicinity, rather it details Coleman property within the City of Lebanon. Under MG-11's subheading IV. *Cities/Boroughs*, three late 19th century maps show a county-wide perspective of Lebanon. Under subheading VI. *Transport*, a 1914 map by Benedict and Strum of Lebanon county's roads, as well as 1931 road map by Hoen and Co. may show sufficient detail to be useful to researchers. Lastly researchers should investigate 3-4 maps within the subheading VIII. *Vignettes*, which show an 1818 map of Dauphin county (out of which Lebanon was formed in 1813), a map of North Lebanon of minimal value, and an 1860 Bridgens map of Lebanon county with several inserts. One of the most helpful maps in the possession of the Pennsylvania

State Archives is a large-format framed Bethlehem Mines Corporation map from ca. 1968 in the possession of archivist Brett Reigh. This map shows the disposition of all the former furnaces (charcoal, anthracite, Burd-Coleman) furnace communities, houses, open pit workings, mine structures, new roads, (i.e. 322 Bypass) and other infrastructural features. Researchers should also pay close attention to the folder marked “Legal Papers (Land Surveys) 1757-1859” which contains warrants, deeds, and maps of tracts in what was Lancaster county, later to become Dauphin and Lebanon counties. Although structures are usually not noted on these legal deed maps, they may be crucial in determining the extent of Cornwall's property during the Grubb and Giles periods. These 18th century deeds are located within MG-182 at slot location **6-3154**. There are additional map sources, including a rare 18th century map of Robert Coleman's property showing farmsteads, furnace, neighborhood structures, and an inset view of the furnace and the charcoal shed, at the Cornwall Furnace site itself in the possession of site administrator Stephen Somers.

7.) Very little is explicitly mentioned about the abbatoir, its construction, or its function and use in the collections at the Pennsylvania State Archives. Engaging a historic preservation specialist or architectural historian versed in mid-19th century farm architecture may yield clues as to the precise date of construction based on materials or methods. Establishing a rough date of construction will economize researchers' time and energy in reviewing the documentary record. Since preliminary research indicates the abbatoir was likely constructed during the decades between 1830-1850, researchers should approach questions of its construction and use much like the entire furnace structure: by conducting a close confined analysis of time books, ledgers, account books, blotters, and correspondence that may detail construction projects during the above decades at Cornwall Furnace. Researchers should be aware of the presence of

alternative names for the abbatoir.

**8.)** See answer to **Question 6.**

**9-10.)** Within MG-182, a collection of microfilmed blueprints of structures within the Cornwall/Coleman cultural domain exists in Folder 18, slot location 6-0132, an entry of which is located on page 4 of the finding aid for the “Robert H. Coleman, 1850-1900” portion of MG-182. The blueprints contain various elevations of Robert H. Coleman's mansion done by Philadelphia architects W.D. and G.W. Hewitt. These blueprints are of the home pictured on page 12 of Carl Oblinger's *Cornwall: The People and Culture of an Industrial Camelot, 1890-1980* (Harrisburg: PHMC, 1984). It is unknown whether this structure is still extant. In addition this microfilm reel contains blueprints of the Cornwall and Lebanon Railroad station in Cornwall, which is now utilized as a borough police and fire station. Another series of microfilm reels may reveal abandoned or lost portions of infrastructure. These reels are located in MG 339, the Cornwall Ore Bank Company Records, and were original Bethlehem Steel Corporation microfilm reels. Upon taking control of the Ore Banks in 1916 Bethlehem began to exhaustively document their property and holdings, including all dwelling structures found around the mine workings. They are found in box in Section D. of MG 339 and are fully indexed. These blueprints may yield information about 20th century changes made to the Manager's House, the dwellings houses, Cornwall station, the Cornwall Borough garage, Good Samaritan Hospital, Donamorgh Hospital, the Cornwall High School, cemeteries, new residential developments like Cornwall Center, i.e. “Toytown”, machine shops, and several churches including modification to the tabernacle and stained glass windows at Sacred Heart (subsequently moved from its original location). In addition, these microfilms document the

expansion of the mine workings since c. 1930s and show electricity, gas, water lines as well as other public infrastructure. They may be useful in determining how the cultural landscape has evolved over time through a succession of corporate owners.

11.) In regard to modifications made to the manager's house, it is clear through analysis of the above reels that Bethlehem Steel effected substantial modification to the Manager's House during the late 1920s-early 1930s as evinced by the amount of blueprints found in Section D. of MG-339. The exact nature of the modifications is unknown but builders and architectural historians can perhaps glean information from this documentation.

### **Theme 2 Overview: Working at Cornwall Furnace:**

As suggested in intermediate reports, the archival collections at the Pennsylvania State Archive mainly consist of disaggregated quantitative data in the form of journals and ledgers that will, with attentiveness to long-term price and wage patterns, allow researcher to draw conclusions as to larger social and economic trends at Cornwall. Through a cursory overview of MG-346, the Cornwall Furnace and Hopewell Forge Account books, researchers may glean information about the late 18th century ironworker diet, consumption preferences, drinking habits, levels of indebtedness throughout the year, costs of implements and foodstuffs over time, rates of pay for job classifications, prices of bar iron, and other social and fiscal details of the firm.

The documentation of MG-346 consists of account books kept by the company's clerk that list workers' purchases of work implements, foodstuffs, and luxury goods. Some books contains indexes and are organized according to personal or corporate accounts. Other books are organized by date and show credits, debts, and notations commingled. An interpretive approach must be developed to assess

the implications of both the goods sold and the purchasers buying them.

Since these account books detail both wages paid and debts settled during the period approximately between 1750-1760, researchers can gain insight into the purchasing power of workers' wages over time. Yet few qualitative descriptions are present that would better characterize financial stress on individual furnace workers' or their families. Regarding pay, these ledgers note both weekly averages and year pay totals according to job category—giving a clear indication of a pay hierarchy. Researchers will also be able to understand the quota systems used to pay wood cutters and coaler's per cord and bushel. Additionally, these ledgers show Cornwall functioning as both an industrial and an agricultural facility with farming duties apportioned to both men and women and pay recorded for farming tasks. As a word of caution, researchers should have experience reading 18th century ledgers and conducting economic analysis with British North American colonial money.

Regarding housing, references to rent charges do appear in MG-346 but it is altogether unclear where these company-owned house were located. In the research action plan that follows, the location of references to the payment of rent will be noted. As suggested by Joseph Walker in his study of Hopewell Furnace, it may be possible that workers lived in nearby farmsteads owned by the Grubb or Coleman estates. In fact, the 18th century ledgers do not yield clues as to the origins or location of some of the tenant houses or whether the proprietors of Cornwall Furnace constructed tenant houses. The first record of the construction of tenant houses appears in 19th century time book. In addition, these records also note that slaves were charged board which suggests they received pay and existed in a strange legal limbo—paid as free laborers but restricted in motion.<sup>14</sup>

As evidenced in the finding aid for MG-346, these accounts and ledgers mainly span the years between 1752 and 1766 – a period of little over a decade. The temporal narrowness of MG-346 is limiting in two ways, first, it is unclear how the Revolution wrought changes at the site as far as

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<sup>14</sup> At other points, these ledgers note payment to whites for assisting in retrieving escaped slaves. See MG-346 Cornwall Furnace (2954) Journals L, M, N, 3/16/1759-2/24-1762.

character of work and price fluctuations.

## **Theme 2: Working at Cornwall Research Action Plan:**

It is recommended that a complete survey of MG-346 be made to ascertain payment amounts and methods at the Furnace during the decade between 1750 and 1760. While the labor of teamsters, woodcutters, and coalers are often frequently mentioned along with payment amount and record of distance traveled, amount cut, and bushels produced, those laborers involved in the furnace stack (limestone/coal heavers) and higher-skilled workers involved maintaining and tapping the blast were compensated. See MG-346 1/1/1753. Company store ledgers such as MG-346's "O" and "P" [Roll 2959] from 2/25/1762 to 4/7/1764 list beef, horse provender, cordwood, and flour other foodstuffs as popular purchases.<sup>15</sup> There are also periodic references to charges to workers' accounts for liquor—and citations were issued for drunkenness while on duty.<sup>16</sup> In addition, ledgers from MG-346 show a diverse company store inventory containing such luxuries as "King of Prussia Handkerchiefs" and "a map of America." The presence of these products at Cornwall Furnace shows a close connection with the consumption trends of the larger Atlantic world.<sup>17</sup> A close accounting of workers' cashflows will demonstrate if provisions and consumable were directly charged against their pay. There was no direct reference to the receipt of money in MG-346.

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15 See John Sullivan's food and implement purchases, at MG-346 Journals "C", "D", "E" 10/1/1752-12/31/1754, entered on December 19, 1752, leger page 105.

16 For a reference to a liquor purchase, see MG-346's Journal "N" February 16, 1761-February 24, 1762 under the May 22, 1760 entry, page 69. It is also clear that a fair degree of social control existed through both positive encouragement and retributive justice at Cornwall. On several occasions "cordial" and other spirits were disbursed, presumably at the end of successful campaigns, see April 6, 1753, ledger page 449. Also, liquor appears to have been freely sold at the company store. Yet some workers faced "citations" and "fines" for drunkenness on the job as was the case for John Smarty, a driver, on 13 September 1762. See, MG-346, Journals "O", "P", "Q", Journal "O": 2/24/1762-4/5/1763, p. 179.

17 See MG-346 Journals "G", "H", "I", "K" from 2/24/1756 to 3/16/1759.

**15.)** In regard to roles of family in Cornwall's domestic and agricultural economies, MG-346 offers only scant references to female labor, although women were compensated for agricultural activities such as “haymaking”.<sup>18</sup> Other collections are better suited to revealing the cyclic nature of industrial and agricultural work at Cornwall in the 18th and 19th centuries. MG-182, containing materials from the Lebanon County Historical Society better illuminates the furnace's agricultural work. Time books often list the name, duration and type of agricultural work. Because both agricultural work and industrial work was recorded in the same volume, it is recommended that researchers pay close attention to MG-182's day books, provision books, time books, and grain books, that correspond to Cornwall Furnace. Researchers are especially encouraged to review the “Time Books, 1855-1881” at slot location 6-3180 particularly the volume marked “Cornwall Furnace – Old Turn Book.” Throughout these volumes are numerous references to threshing, harvesting, haymaking, and other agricultural duties. Researchers should take pains to identify which agricultural properties were owned by the Coleman Estate and cross check furnace workers—or their family names—with those names appearing in the agricultural rolls.

**16.-17.)** Within MG-346 and MG-182, where accounting records predominate, there is little indication of a great rift in status between workers and managers at Cornwall furnace during the late 18th and early 19th centuries. The above records collections are only moderately useful in explaining the formation of a class consciousness and few of the records contain personal accounts or qualitative evaluations of life at Cornwall. However through the records of MG-339, comprised mainly of the business records of Cornwall Ore Bank Company and spanning the years 1802-1950, however, allows researchers to better understand the sometimes fractious,

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<sup>18</sup> See MG-346 Journal “N” February 16, 1761-February 24, 1762



sometimes peaceful, relationships between management and labor. Fortunately, a preponderance of MG-339's correspondence was created during the rise of a late 19th century and early 20th century movement for greater managerial efficiency—thus both the Cornwall Ore Bank Company and its successors kept typewritten notes on previously unknown areas of a business life.<sup>19</sup> Of the four major manuscript and records group collections reviewed in this survey, MG-339 contains the most material written in miners' own hands, as well as the most documentation on the relative safety of ore mining at Cornwall. Additionally, MG-339 contains considerable information on workers' housing including: material on rent costs, housing quality and sanitation, and petitions for better housing among others.<sup>20</sup> While a higher proportion of the Cornwall Iron Ore Banks Co. records are helpful in illuminating mining conditions, the labor situation, and corporate welfare systems, a portion of MG-339, section “A--Business Records, 1862-1924” is worth investigating very closely. For instance, In regard to **Question 16** inquiring whether managers received free accommodation, the above folder contains mention of the respective rents of two mine managers, R. Harrison Souder and W.J. McLaughlin having to pay \$45.00 and \$20.00 respectively for monthly rent in August and September of 1918. Based on the fact that monthly rent in an Cornwall worker's home was \$4.00, this represents an astronomical increase in monthly rent. Also mentioned is W.J. McLaughlin's monthly income: \$493.17 which means that his rent comprises just 4% of his income—seemingly a discount.<sup>21</sup>

14 **18.,19.,20.)** As stated prior, no other collection rivals MG-339 in the depth and detail of its depiction of the relationship of the ore company to its employees. This collection's three major divisions, A—Business Records, B—Legal Papers, and C—Accounts should be

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19 Especially in regard to the social conditions of the miners.

20 Material found in MG-339 on miners' housing conditions was often corroborated in the transcripts of oral histories from the Cornwall Oral History Project portion of MG-409.

21 MG-339, “A—Business Reports, 1862-1924,” Carton GM 2279, July 8, 1918-September 24, 1924 Folder.

closely reviewed as they tell the story of the Ore Banks Company's growth from an appendage of the Furnace to a necessary component of the Colemans' industrial system to a large-scale extractive mine under corporate control. On a business level, the growing importance is reflected in the mine's graduation from local production linkages to more regional and national networks.<sup>22</sup> With the increasing sophistication of the plant to boost output, a corresponding change in the relationship of the company to its employees is noted. Within MG-339 is reflected a trend toward corporate interest in social welfare, unionism, and a modicum of industrial safety. In regard to unionization at the mine in the latter half of the 19th century, the documentary record is unclear. It is customarily reported that the Lebanon Valley region had deep cultural antipathy to industrial unions.<sup>23</sup> What complicates this interpretation is the presence of industrial spy reports in section B—Legal Papers, within the folder containing Agreements 95-113. These reports were apparently commissioned by the Pennsylvania Steel Company, and similar reports exist at the National Canal Museum in Easton, Pa. Much of section B—Legal Papers is important to understanding the expansion of the facility's productive capacities and the attendant growth of corporate power at the mine in the early 20th century. There are agreements authorizing new police officers, correspondence between the Ore Banks Company and its suppliers, tabular data showing the percentage of Cornwall ore to national production. After 1915 there are state-mandated injury report cards, reports on the death of workers (Peter Fageny), affidavits taken of workers who witnessed accidents, Pennsylvania Department of Labor

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22 Sole Coleman ownership of the mine ceased in 1864 when a group of proprietors formed the Cornwall Ore Bank Company. In the early 20<sup>th</sup> century, Robeson Iron Company, the Pennsylvania-Maryland Steel Company, and Lackawanna Iron and Steel Company purchased controlling interest in the mines. By 1916, Bethlehem Steel had acquired both the Pennsylvania-Maryland Steel Company and Lackawanna, thus exclusively controlling the mine until its close in 1974.

23 Carl Oblinger asks whether it is true the region was “the graveyard of unionism” to mine worker Earl Kohr in the Cornwall Oral History portion of MG 409. Kohr seems to suggest that labor organizers from the coal region found a receptive audience in the Lebanon Valley in the 1930s.

accident reports with descriptions of injuries, and other documents revealing the dangerous conditions at the mine. In regard to the welfare of injured or killed employees, documents such as minute books of the Ore Company Board, found in MG-339 A—Business Records tell the story of late 19th century corporate paternalism. On several occasions in the 1860s and 70s, the board received requests for the construction of new housing from J.T. Boyd, the company's superintendent. What usually follows in the monthly minutes are reports of the progress on construction of tenement houses. Further it is clear that the homebuilding program was an attempt to stabilize rates of turnover at the mine.<sup>24</sup> These minute books, which begin at the Ore Banks Company's inception in 1864 and continue until the Bethlehem Steel takeover, also show an interest in providing somewhat reasonable injury and death benefits. At the September 18, 1867 meeting it was reported that Daniel Hise, who had been “blown up by the premature explosion of a blast” and blinded in one eye, would receive half wages until next month. The March 1871 meeting minutes reported that Hise was still receiving 15 dollars per month in benefits.<sup>25</sup> There are also records of death benefits being paid to “destitute” families of killed miners and donations being made to area hospitals which provided medical aid to injured miners. These board meeting minute books, therefore, are crucial in understanding the relationship of management to employees in the era before corporate ownership of the mine.

**21.)** Regarding the mobility of workers, this question is not overtly addressed by the documentary record. Within MG-339, B—Legal Papers, Agreements at slot location GM 2320, there is a single 1923 letter from blaster Grant Metley to Superintendent W.A. Burroughs expressing his inability to pay higher rent to live in his Miners Village home. A twenty-year

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<sup>24</sup> In an board minute entry for March 1872 it was expressed that a shortage of houses was “making us dependent for 2/3 of our labor on transient men, which cannot be depended upon during the summer season.” The construction plan proposed to remedy this was “two blocks a year (double houses) until we obtain that number which could be done without being felt on income.” See MG-339, A—Business Records, Minutes 1864-1921, slot location GM 2230.

<sup>25</sup> Hise's case may have been atypical on account of him having an “idiot” child.

veteran of the mine, he was perturbed by Robesonia Iron Company's rent increase, calling it “a bit of spite work.” MG-339 does contain the largest collection of personnel records for workers at the mine. Another document within B—Legal Papers from the Robesonia Iron Company details the age of workers, their length of time in the company's service, and their present rate of pay. With the exception of four men with ten (10) years service, most had little over 4 years with the company, perhaps indicated that turnover was high. With only fragmentary evidence we can say with some probability that turnover was relatively high. Another more time-intensive strategy would be to scan the time books and logs of MG-182 and the smaller MG-203 and track a sample of names over a space of time to determine whether workers stayed for extended periods at the Furnace.

**22.)** As with the difficulty determining class consciousness of workers and managers, it is difficult—but not impossible—to recreate the Coleman's view of their industrial empire, their social dominance, and their place within a national industrial elite. At Cornwall Furnace, site administrator Stephen Somers possesses a copy of the entire Coleman line beginning with Robert Coleman and ending with Margaret Coleman Freeman Buckingham. A similar genealogy exists in MG-339, B—Legal Papers, Agreements 1-20 Folder. Beyond lineage charts, it becomes difficult to characterize what seems a conscious decision by the Burd-Coleman-Freeman families to solidify control over industrial operations in and around Cornwall. MG-182 contains the most material on the Colemans exclusively. Within this collection is a small amount of microfilmed documents and papers relating to Robert H. Coleman's railroad speculations and land developments in Florida in the 1880s-1890s. Of interest though, are blueprints of Robert H. Coleman's mansion designed by the Hewitt Brothers of Philadelphia. Some of Robert H. Coleman's social correspondence, helpful in illuminating his relationship to

Trinity College and elite New York City, can also be found in MG-182.<sup>26</sup>

These documents relating to the Jacksonville, Tampa & Key West Railroad System and various other transportation companies in Florida demonstrate that small-scale iron production created highly mobile capital which was applied to newer distant ventures. Furthermore, it is apparent that small-scale iron production families attempted to shed their apparent parochialism and emulate the stylized opulence of America's *nouveau riche*. Statements show that Robert H. Coleman had nearly \$758,000.00 on hand in 1887, that the Colemans regularly traveled to Europe, and that he was intimately interested in Jacksonville, Florida's real estate development.<sup>27</sup> Researchers should also investigate the Coleman's connection to both Lancaster and Philadelphia cultural elites. In Philadelphia, Margaret Coleman married Joseph Hemphill and maintained a summer estate at Strawberry Mansion in Philadelphia's East Fairmount Park.

**23.,24.)** As alluded to in prior responses, MG-346 only presents a partial view of 18<sup>th</sup> century life at the Furnace. Since most of the furnace and forge books of 346 end before the revolution, there is no mention of the Hessian laborers who were famously employed at the site during the war. These records of the furnace during the Revolution are in the possession of the Historical Society of Pennsylvania. It is also difficult to identify who and who was not an indentured servant, and so it is nearly impossible to determine what kinds of work was reserved for slaves, indentured servants, and free laborers. Consultation with John Bezi-Selfa's work on use of slave labor in 18th century middle-Atlantic furnace may yield insight into job classification according to race and/or level of legal freedom. As mentioned in this section's introductory remarks, slaves were doubly persecuted by masters who required them to pay for both accommodations

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26 Box 6-0136, Folder: General Correspondence 1876. One letter from R.H. Coleman's sister Anne contains a curious story about a baby being left on the Coleman's front porch in Cornwall. Contains dance cards, calling cards, and various letters to family.

27 This portion of MG-182 microfilmed is roll 3999, Rolls 1-5.

and food but did not allow them any freedom of motion. An entry on April 29th, 1761 shows that “Hopewell Forge” had been “pd.” for providing someone named “Philiy Coale” who assisted Cornwall's in “going after runaways.”<sup>28</sup> Periodic inventories of slaves show that about ten worked at Cornwall during the 1760s.<sup>29</sup> State archivist Brett Reigh has written on slavery at Cornwall and has utilized sources at HSP.<sup>30</sup> Regarding free black workers in the 19th century, very little is explicitly mentioned. A fascinating document exists in MG-339, B—Legal Papers, Agreements folder 138-159 which indicates that racial antipathy translated into inferior housing for black miners. In a September 30, 1918 list of “Appropriations and Expenditures for Improvement” there is mention of the cost of a “eating house for Negro Laborers” and that \$1300.00 was spent on building 12 “wooden Negro shanties”—the only time that “shanties” appears as a substitute for “dwelling” in any of the records. More research in MG-203 and MG-182 is required to flesh out the story of indentured miners and slaves.

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25.) MG-409 contains roughly 15-20 oral history interview recordings along with heavily redacted transcriptions. Most of these recordings were conducted by Carl Oblinger as a portion of a larger state-wide oral history program in the late 1970s and early 1980s.<sup>31</sup> The interviewees were mainly Eastern Europeans and Italian immigrants though some were native “Dutch” Germans. Most, if not all, worked in the ore mine or in processing facilities in Lebanon. These accounts provide an unprecedented level of detail of social life in and around the mine workings.

Of particular interest: Mike Stefonich—who recalled the starting of Bethlehem's welfare

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28 MG 346, Journals L,M,N, entry for 29 April, 1761.

29 MG 346, Journals L,M,N, entry for 21 August, 1761. Susan Dieffenbach notes that the last slaves appeared on Cornwall's ledgers in the 1790s. One-time Cornwall intern Linda Retellack has written a short overview of job classifications at Cornwall available in the site archives. While much of it draws from secondary material, she too incorporated material from HSP.

30 Reigh has noted in his research that slaves performed the most menial tasks at the furnace like woodcutting and hauling. Only rarely could a slave enter into more skilled positions like furnace keeper, though none of the sources reveal why managers prohibited slaves from entering other job types.

31 Portions of which were used in Oblinger's book *Cornwall: People and Culture of an Industrial Camelot, 1890-1980*.

program; the conflict between his own political interests and Bethlehem's ambitions; receiving free water for nearly 30 years. Albert Perrini—on the frictions between the “new” immigrants and the native “Dutch”; socializing at an old hall in Goosetown; better conditions at the mine during summer; foodways. John Yoklovich—explained how the Coleman-Freeman families were intermingled; the role of the concentrator or “concy”; what Bethlehem did with the gold produced at the mine (an enduring apocryphal story around the mine); the origins of the “Cornwall pellet” a form of pelletized ore. Percy Steffenson—was an outsider and an engineer, making his perspective distinctive. Steffenson explains the separator process, how the first pellet plant in the world was at Lebanon; the “clannishness” of the Pennsylvania Dutch. Red McDaniels—scrounging for firewood at the “concy”. Mrs. Warner Franklin, Jr—an African American woman and migrant from North Carolina whose husband worked at Burd-Coleman before entering the mine. She recounted how he was assigned carrying pig iron (a high paying job); Franklin also describes the conditions of the company homes; the insularity of nearby communities; traveling to Lebanon regularly for groceries. These accounts are integral to corroborating accounts of conditions in and around the mine. They should be carefully scrutinized.<sup>32</sup>

### **Theme III: Cornwall Furnace as a Business Overview:**

MG-182 is extremely helpful in explaining Cornwall furnace's slow transition from a small-scale combined agricultural/industrial facility with nearby markets, minimal cost accounting, operating on slow information flows to a firm with numerous plants each producing specialty products, close

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<sup>32</sup> Some of these transcripts contain typographical errors and are heavily redacted and often contain corrections of phonetic spellings. Sometimes these corrections and errors tends to impede easy understanding. All original tapes of the interviews are available for clarification.

connectivity with market fluctuations, and an aggressive sales and cost accounting divisions. Truly, Cornwall's is the classic story of protoindustrial firms expanding but not developing the requisite size and market niches to compete past the 19th century.

In respect to Interpretation Plan questions 26-37 regarding Cornwall's conduct of business during the 19th century, MG-182 is extraordinarily helpful. Beginning with ledgers and journals covering Robert Coleman's (1749-1825) tenure as ironmaster, it is clear that stoves—in addition to unfinished “pigs”—were a primary commodity, as well as “gudgeons cranks,” saw mill cranks, cylinders, grates, and flanges.<sup>33</sup> By the 1840s, Robert Coleman's sons are looking to improve their physical plant and apply modern cost control and accounting procedures. Clearly, the Cornwall charcoal furnace is seen as but a part of a rapidly improving constellation of furnaces under Coleman control. By the 1850s, the volume of letterhead reading “Cornwall Anthracite” demonstrates the transformation occurring in the Coleman iron empire. With the establishment of the anthracite furnace in 1849, additional improvements were made to the older charcoal furnace. In August 1848, Cornwall Anthracite Time Books mention that construction had begun on new tenant houses and that “masons” had commenced “quarrying stone for the furnace.”<sup>34</sup> Yet the firm is increasingly reliant upon distant machining firms to fashion the boilers, pipes, and cylinders necessary for the anthracite facility's new hot blast machinery and ore roasters. The firm was also preoccupied with securing low cost coal and cheap transportation of their pig iron to Baltimore, Philadelphia, and Pittsburgh. Cornwall's jobber in Philadelphia, Cabeen & Co. informs company managers of prospective large-scale purchases, alerts them of his depleted stock and the threats of undersellers. Beginning in the 1850s on until the 1880s Cabeen managed the flows of Cornwall's various grades of iron in Philadelphia.

If these developments suggest that Cornwall had become a full-fledged vertically integrated

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33 MG-182, Box 7-4366, Folder: Robert Coleman and Heirs, Accounts 1840-1841 Misc. Account Books, “Weight and Price of Stoves, Etc.” 1840.

34 Whether this is stone for the Cornwall Anthracite or Cornwall Furnace is unclear. Construction of the distinctive Gothic Revival style Cornwall Furnace has been dated roughly around 1848-49. MG-182 Coleman Collection, R.W. & W. Coleman Accounts, Time Book, 1848-1861.



corporation after the foundation of the Cornwall Iron Ore Banks Company in 1864, this is to ignore two key elements of Cornwall's economic order. One, the firm did not have direct control of coal, nor did it ever have an exclusive low-cost coal transportation provider. Throughout the 1850s and 1860s managers of the firm consistently played off canal companies against railroads and threatened to take their business elsewhere unless “inducements” were given. Secondly, while the expansion program of the late 1840s suggests the formation of more rigid corporate environment, Cornwall was still married to an agricultural life-cycle. Wheat had to be sown, reaped and collected; grain had to be “cradled”; potatoes planted; oats harvested; beef butchered.<sup>35</sup> While Cornwall's various production facilities were seemingly organized under the aegis of a modern corporation, elements of life still resembled more 18th century patterns.<sup>36</sup>

As Susan Dieffenbach has pointed out in her guide to Cornwall Iron Furnace, the Civil War period proved disastrous for smaller firms like Cornwall. In a direct reversal of Revolutionary War fortunes, Cornwall suffered from the intense competition between arms producers during the war between the states. Additionally, it seems that Cornwall lacked the quality control to create weapons grade iron for the production of cannons. In the Summer of 1861 the Navy Department's Weapon's Bureau requested a single breech casting for one of John Dahlgren's new heavy rifles, with 50 more to follow. Cornwall avidly, yet unwisely, produced the full amount but the government found the quality completely “worthless” and declared the contract void. Coleman attempted to seek redress from the government and recover his loss but he was rejected. Other firms like the Phoenix Iron Company met a similar fate, the government barring payment for defective goods.<sup>37</sup> In the postwar era, Cornwall continued to produce both hot-blast and cold-blast pigs, most of which were sent to larger iron firms for remelting into shapes. The Cornwall Iron Ore Bank Company continued to provide various grades of

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35 All of this can be found in the Time Book, MG-182 Coleman Collection, R.W. & W. Coleman Accounts, Time Book, 1848-1861.

36 MG-182, Coleman Collection, R.W. & W. Coleman Accounts, Box 7-4390, Provision Book, 1844-1848. List of products bought by company employees: bacon, shad, potatoes, salt, corn, butter, wheat, spare rib.

37 MG-182, Box 6-3162, Folder: General Correspondence August-October 1861.

ores to local iron and steel producers after the Civil War. Very good ore books exist within this collection detailing the exact location and grade of ore sent.<sup>38</sup>

Though some of the material of MG-182 resembles the 18th century journals and ledgers of MG-346, the sheer volume of business correspondence (mainly in the form of letterpress books) allows researchers to probe the depths of Cornwall's business strategy in the 19th century, to understand its major products, and its connection to larger iron and steel makers. During this period, management produced great amounts of detailed tabular data on workers, their various duties, on shipments of coal, ore, and limestone, on the amount of materials entering hot blast furnaces, on the amount of iron produced, and where it was shipped. This collection's weakness, however, is its emphasis on the Anthracite Furnace rather than the charcoal furnace. This collection is most developed during the period 1840-1880. Starting at about 1915 is correspondence concerning Bethlehem's takeover of the mine from the Cornwall Ore Banks Company and the modernization of the mine and surrounding communities. Some documents indicate that a rift between Bethlehem and Robesonia existed as both operated in the Cornwall pit before Bethlehem's complete takeover. Documents reveal that Robesonia and Bethlehem differed on mining practices and Robesonia's management kept close tabs on employees defecting to Bethlehem's jobs and cheaper rents. It is obvious, too, that as a major national steel producer Bethlehem demanded higher yields from the mine. The impact of this economic reality on Cornwall miners is currently unclear.<sup>39</sup>

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38 MG-182, Box 6-3164 R. W. & W. Coleman + Co., Folder, "Accounts, 1860-1864, Ore Book."

39 Material on the Cornwall mine from roughly 1890-1950 is abundant. Most material relating to conditions at the Cornwall Iron Ore Mine immediately before Bethlehem Steel's takeover in 1916 are found in the papers of the Robesonia Iron Company, a firm given all rights to the ore deposits from the Coleman family. [Box 6-0106; Box 6-0136; Box 7-4624] Much of this material concerns the amount and quality of various grades of iron and copper to a lesser degree. Daily labor reports provide insight into the ethnicity of new immigrant groups. Documents which resemble reports on miners defecting from Robesonia, as well as notices of garnished wages for overdue rents reflect growing corporate oversight. Minutes of the Cornwall Iron Ore Company tell the story of Bethlehem's gradual takeover of the facility.

### **Cornwall as a Business Research Strategy (26-37):**

Materials at the Pennsylvania State Archives are not suited to conducting a comparative analysis of Cornwall's production rates, composition of labor force, extent of markets, etc. Researchers may make a direct comparison to conditions at Robesonia Iron, though none of the furnaces within the Coleman-Cornwall constellation ever achieved the size and technical sophistication of Robesonia. A good starting point for developing contextual knowledge for a comparative approach would Arthur Bining's papers (RG-23) at the Pennsylvania State Archives.<sup>40</sup> As indicated in the overview, good data does exist in the form of the letterpress books of MG-182. Virtually all of information regarding the charcoal furnace's day to day details comes from MG-182, especially the letterpress books spanning the years 1848-1873. From these accounts, it is clear where the anthracite furnace and the cold blast charcoal furnace receive their machined parts and to which firms their pig or billets were destined.<sup>41</sup> For most of its existence in the 19th century, the charcoal furnace did not produce finished goods, instead it shipped its brand of charcoal iron pigs to machining firms where they were reheated in crucible furnaces and turned into car wheels, durable machine parts, breech blocks, and other high grade uses. Regarding its own equipment, it appears that after the application of machined iron to the ironmaking process, the charcoal furnace was reliant on specialty firms to produce the piping, cylinders, hoisting gear, tuyeres, and blowing engines. Focusing on the years prior to 1840 may reveal

correspondence between the firm and the Cold Spring Foundry which manufactured the blowing

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40 Arthur Bining's *Pennsylvania Iron Manufacture in the 18th Century* is a good point of departure. Paul Paskoff's *Industrial Evolution* is useful in understanding how Cornwall fits into a statewide incremental move toward greater technical sophistication—the persistence of the charcoal furnace and simultaneous maintenance of an anthracite furnace seems to confirm Paskoff's thesis. Other more narrowly focused studies like Walker's *Hopewell Village* will provide good context for interpreting raw data of ledgers, balance sheets, and letterpress books and forming a view of Cornwall's economic and social life.

41 Cornwall's billet market can be best defined as Mid-Atlantic after the Civil War. Before the Civil War, Cornwall's pigs traveled to large markets like Pittsburgh and Philadelphia but transportation was still canal-based and the scale of its distribution essential colonial. After the Civil War the furnace is far more reliant on railroad transportation and is shipping more volume to Pittsburgh and Baltimore, for example.

engine for the charcoal furnace. As suggested in the overview, determinations of whether Cornwall furnace was a vertically integrated facility will require individuated analysis of the production and expansion patterns of the furnace in the mid-19th century.<sup>42</sup> With respect to individual business strategies and collusion with other firms, clearly the letterpress books reveal that the firm used coercive methods to achieve the lowest transportation price. Whether or not the firm engaged in price fixing will require closer scrutiny of the letters between the firm's longtime secretary A. Wilhelm and their agent at Philadelphia, Cabeen and Co. Besides demands that Cornwall iron be sold at the price of "Crane Iron" and thus remain competitive, there is little mention from Wilhelm of more mendacious approaches to pricing. Concerning the Colemans' perception of their "empire" this question is difficultly answered. Within **MG-182, Box 6-0136** contains the bulk of the Coleman personal correspondence, though most of it is social and very little of it refers to inner details of the firm's business strategy. It can be expected that most of the Coleman males engaged in business were politically, culturally, and socially indistinct from a type of Victorian malehood that prized political conservatism, industry, thrift, and proper social decorum. One folder in MG-182 Box 6-3162 entitled "Act Encouraging the Construction of Lateral Railroad" seems to contain a bill Robert Coleman found attractive. The substance of the bill was to allow railroads to mortgage lateral or branch railroads (adjacent lands) to enable bonds to be issued against this property. Beyond this, however, the Colemans' political interests are unknown and it is tough to gauge workers' political activity in the 19th century. A brief review of some newspapers printed in Lebanon City and County yielded no mention of labor activity or agitation at the furnace. A 4 November 1840 edition of the *Lebanon Courier* does include articles such as "My First and Last Visit to

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<sup>42</sup> As indicated in the overview, while the iron furnace may have shown signs of vertical integration, to this researcher Cornwall remained a firm dominated by a single-proprietor, without clear linkages and control over either raw materials or transportation.

the Dram Shop,” an account of Timothy Truesdel, once a “very worthy industrial mechanic” now a “curse to his family.” Another 30 December 1840 item in the Courier advertises a “meeting of the Lebanon Temperance Society” at the Temperance Hotel in Lebanon. These didactic tales suggest little as to whether workers at the furnace made sojourns to the dram shop—nor should they indicate that an ethos of social restraint pervaded the region. Rather they are but clues as to the ambient culture. More research into regional newspapers may turn up mention of labor agitation, unrest, or ethnic friction at the furnace. By the 1880s, the letterpress books show that Cornwall Furnace has largely vanished, though mention of the Anthracite Furnace and Colebrook also figures prominently. Regarding the decline of the charcoal furnace, researchers should see the continued operation of the furnace into the latter half of the 19th century as a calculated attempt to capture the cold blast charcoal billet niche market and that it was, according to production numbers, an insignificant affair within the larger network of the Colemans' more modern (1850s) furnaces. Researchers should identify what made cold blast charcoal iron attractive to some clients and also investigate how other processes filled the need for this niche product in the late 19th century.<sup>43</sup>

**Theme 4: Cornwall Furnace as a society/community Overview/Research Action Plan (38-43):**

Regarding the origins of 18th century workers, in only one case is a worker described as a “Duchman”, though a cursory analysis of names suggests that most were either Pennsylvania Dutch or Scotch-Irish. In one index of debts, a descriptive note is included about the debtor:

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<sup>43</sup> Clearly the Colemans were committed to technical innovation like many firms across the state. See Paskoff, *Industrial Evolution*. To characterize the failure to “modernize” the charcoal furnace (IP, 37) as a missed opportunity is to misunderstand 1.) that the Coleman's had an anthracite furnace and 2.) the role of the charcoal furnace in a larger product-oriented business strategy. See Harold Livesay, “Marketing Patterns in the Antebellum American Iron Industry,” *The Business History Review*, Vol. 45, No. 3 (Autumn, 1971), pp. 269-295

either their occupation or their place of origin. Further analysis of this list may better illuminate this issue.<sup>44</sup> The proportion between the Dutch and the Scotch-Irish appears to be equal; it is unknown whether blacks or Eastern Europeans worked at the furnace in large numbers though some of the interviewees appearing in the oral histories were Italian, Slavic, and black, though they were affiliated with the ore mine. More detailed analysis must be done to determine whether larger numbers of Irish Catholics were employed at the furnace in the 1840—though it would be difficult to determine whether these Irish were new arrivals. County newspapers may reveal friction between old immigrants and new, though nothing was overtly encountered in the 19th century records at the Pennsylvania State Archives.<sup>45</sup> The Colemans built several Presbyterian churches in both the city of Lebanon and in Cornwall Borough, suggesting that the industrial family prized religious devotion as the keystone of their communities. Their own religious habits are not distinctly known, though it is clear that Robert Coleman valued sobriety and industry from his workers.<sup>46</sup> Whether the Colemans saw religion as a having socially pacifying value is also unclear, though both churches were built in the Gothic style. At one point in her correspondence, Anne C. Coleman recounts to her brother that she “sang in church this morning a hymn that you sang (or rather did not sing) in chapel Nov. 19 of last year.” Sacred Heart Church is the closest place for Catholic worship, and it was later moved closer to the mine and furnace. This structure seems to date from the late 19th or early 20th century, appropriate considering the pace of immigration at that time. The documentary record at the State Archives is not suited to telling the story of religious friction between Protestants and Catholics in Cornwall—researchers would profit from a survey of local churches' or diocesan

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44 MG 346, Journals L,M,N, entry for 28-29 February 1761.

45 For friction between Pennsylvania Dutch and “newcomers” in the 20th century, see MG 409. In the case of Albert Perrini, an Italian immigrant, acculturation into the Pennsylvania Dutch cultural hearth came relatively easily.

46 Letterpress book entry, MG-182, “R.W. + W. Coleman per A. Wilhelm June 1858-1859,” letter dated Dec. 16., 1858, ledger page 184. Researchers should pay close attention to the personal correspondence section of MG-182, notably box 6-0136.

archives. A newspaper review may also yield mention of rifts but in the absence of a clear time scope this method may be time consuming. Regarding leisure and quality of life, the records at the State Archives are also generally deficient. Aside from mention in the 20th century oral histories of watering holes, dance halls, and playing fields frequented by miners, there is very little known about the places dedicated for workers' relaxation. MG-182's class bias is revealed in the abundance of material on the Coleman's own leisure activities: notes on traveling abroad, dance cards, mention of outdoor sports, scorecards, and other wispy recollections of social engagements abound in their personal correspondence. Regarding workers' access to information, 18th century ledgers reveal that workers (presumably) were purchasing a "map of America" even before the Revolution, "K[ing] of Prussia handkerchiefs" and "Scotch diapers" though the last item probably did not derive from Scotland. What workers read, however, is more difficultly understood. The State Library possess discontinuous runs of the *Lebanon Advertiser*, the *Lebanon Courier*, the *Evening Report*, the *Lebanon County Independent*, the *Lebanon Daily Times*, *Lebanon Daily News*, *Lebanon Free Press*, the *Daily Report*, and various other German language publications. Regular rail service from Lebanon to Cornwall probably ensured that these newspapers were accessible but no records exist that indicate levels of readership. This same railroad connection would have placed lectures, concerts, pageants, and political engagements within the reach of Cornwall miners but no reports exist. Regarding burial sites an 18th century map of the area does not show burial sites, though closer examination of the original map may show the presence of a cemetery.<sup>47</sup> Within MG-339 there is a set of ten (10) Bethlehem Steel microfilm reels with hundreds of plans, blueline drawings, and geophysical maps. Contained with these reels are architectural renderings of most structures in Bethlehem property as well as a prospective drawing for the improvement of both

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47 This map is in the possession of the Cornwall Furnace archive, see site administrator Steve Somers for the original.

the alter and tabernacle at Sacred Heart Church dated 20 May 1943. In addition there is a reproduction of a “Plan of Cornwall Cemetery” designed by H.C. Grittinger dated 14 October 1879.<sup>48</sup>

### **Photographs:**

Several photographs exist in the Arthur Bining Collection (**RG-23**) at the State Archives. Generally, however, they are of poor quality:

- 1 photograph of Cornwall, ca. 1900 taken by Luther Harkell
- 2 postcards of the above image
- 3 postcard of Revolutionary cannon/cannonballs
- 4 leave from book showing same image of cannon/cannons
- 5 image of stoveplate produced (1772) produced at Cornwall

**RG 13**, PHMC Internal Files, Box 5-0754, Box #1 contains images of company houses near Cornwall, some woodcuts, historical photos, and excellent photos of the Cornwall Iron Ore Bank, its pits, trackage, breaker and separator plants. Some ca. 1960 photographs of the interior and exterior of the Cornwall site are also found in this box.

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<sup>48</sup> See MG-339 CORNWALL ORE BANK COMPANY (CORNWALL MINES) D. CHIEF MINING & PLANT ENGINEERS DEPARTMENT, BETHLEHEM CORNWALL CORPORATION