

Cornwall's Iron Economy

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The iron and steel industry that we think of today is one of sprawling plants and mills, truly a giant among our present day industries. Steel is the beast of burden upon whose back rests much of the weight of the rest of the economy and basic industries. Steel is the trunk of the tree of the nation's economy, which supports and nourishes the rest of the smaller branches. However, as is the story of all giants, steel had its days when it didn't represent massive mills encompassing large numbers of employees. These days of the growing sapling were best illustrated by the picture of the local iron master, his small furnace or forge and a handful of employees. This growth was gradual and steady but at times was stimulated by incidents such as the Revolutionary and Civil Wars. During these periods of conflict, the forges and furnaces furnished the arms and ammunition to be used by the armed forces. Many times, as were the cases of the owners of Cornwall, the Grubbs and the Colemans, the owners of the mills were called upon to lead the local groups of men into the battles in the locality. This leadership of the local ironmasters was not limited to the field of military affairs.

Quite often the men were called upon to lead in the role of township, county and even at times, as state political leaders. If not in the role of the leaders then as the men who acted as the electors of the leaders and policies to be followed by the governments. A good example of the local ironmaster in the role of political participate, is Robert Coleman, who took

part in the State Convention, which drew up the Constitution of 1790. Thus the men, who ran the small local mills were men of much foresight and were capable in other fields besides the manufacturing of iron and other metal products.

Now we shall examine in finer detail the development of a furnace and the other facilities connected to it. In the case of this writing the furnace in the limelight is Cornwall Furnace, one of the major furnaces of this locality. The Ore Banks of Cornwall will also be considered in some closer examination.

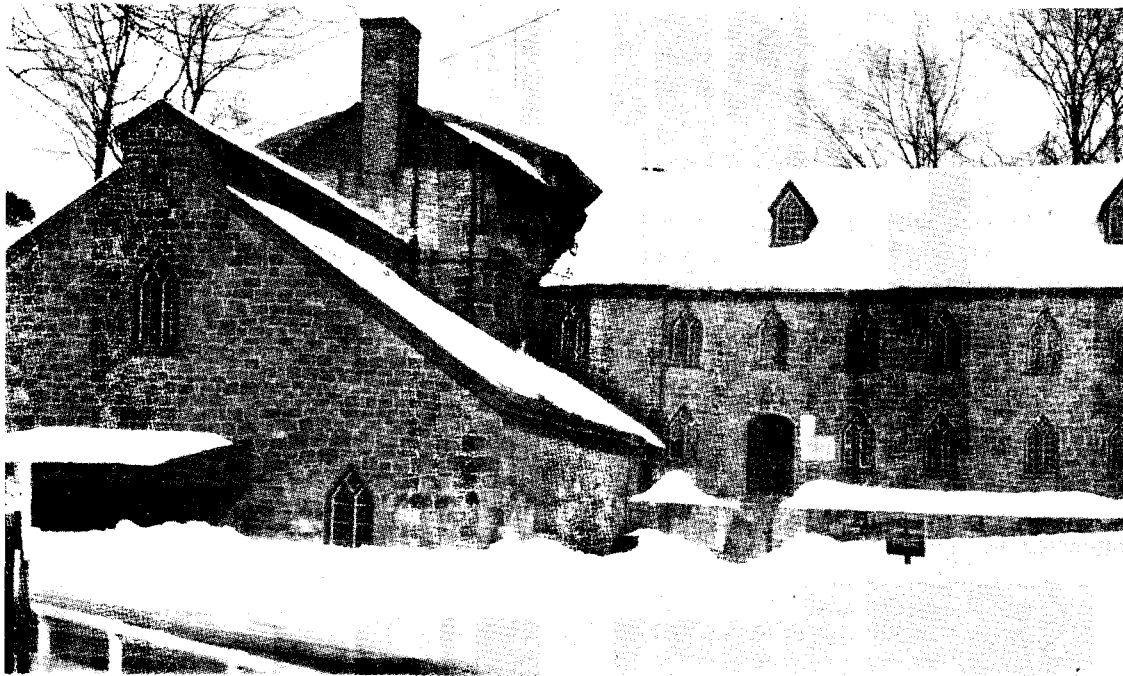
Winding along Route 322 south of Cornwall in Lebanon County, one is confronted by a large open pit mine, nestled in among the mountains and the hills. This is the famous Cornwall Ore Mines. The great depth of this pit is even more greatly emphasized by the height surrounding it. The hills are named the Furnace Hills by the people of this locality. The mineral content of these hills is so rich, that even though it is basically an iron ore mine, the copper and silver derived from the ore practically pay for the mine's operation. The Cornwall Mine is the oldest iron ore producing property in the country, having started production in about 1730 and continuing up till the present day. When this huge deposit was discovered, there were three hills, made up of magnetic iron ore and easily acquired because it was so very close to the surface. However, no matter how large this ore deposit was, it would not have been fully developed, if the other components necessary had not been close at hand and the individual to correctly blend these factors.

One of the necessary factors for development was an abundant supply of limestone. Limestone is used in the process, mainly as a purifying agent in the smelting of the ore into iron. Limestone deposits in the nearby regions were within easy access to the individual, who stepped forward to develop this enormous store of natural resources to its fullest potential.

A second factor just as important as the limestone is charcoal. Charcoal was the fuel used to furnish the great heat needed in the blasting process. The surrounding area was covered with a heavy stand of timber, especially the hardwood needed for the best charcoal. The use of coke was not yet discovered at this early date in history. Since the furnace was operating before the days of the coke heated furnace, charcoal was the only fuel, which gave off enough heat to melt the ore and the other ingredients to form desirable iron.

The cold blast of air is also a necessary component of the smelting process. The cold blast was put forth by a large leather bellows. The problem of power to operate the huge bellows was solved by the use of a large water-wheel. A strong stream of water to turn the large wheel was also to be found nearby and could easily be harnessed to furnish the turning power. Right at the site of the furnace there is a strong stream of water and two miles west of the site is a stream, known later as the Hammer Creek.

Thus the other three natural resources so necessary in the manufacture were close at hand to be used in the proper procedure to produce utility from formerly useless resources. Even with all these resources so near at hand, two other elements are necessary to develop raw materials into



Cornwall Furnace

useful commodities. One of these elements is that of a supply of skilled craftsmen. However, this area is well populated by German craftsmen. There were men needed to pour the castings, charge the furnace and provide the backbreaking labor and sweat to cut the timber to be used as charcoal. When the process reached completion, the product then had to be shipped and marketed. The goods were transported along the Horseshoe Pike to the chief market, Philadelphia and the surrounding area. The Horseshoe Pike is known today as U. S. route 322. The road is said to have derived its name from the practice of the teamsters of hanging all horseshoes they found on the road on posts or trees to facilitate the finding of the lost horseshoe. When the road became muddy and time was most valuable, no driver had time to stop and hunt a lost shoe. Thus the practice had great merit. Although the pike has lost its picturesque name through the years, its value to the area can still be appreciated, no matter how rich a section, it would be useless without a means for transporting the finished product to the market.

As is the case of the farmer, the weather can be perfect, the ground rich and the seed in the barn, but with the absence of the wise farmer, the bumper crop is lost. So it was with the development of Cornwall, the time was right, the raw materials were present and the ore lay close at hand, but were given value only because a man arrived to correctly blend these materials. The man, who arrived on the scene at this time, was Peter Grubb, future iron-master.

Peter Grubb was the man picked by destiny to unite all these factors at hand and direct their early development. At this time we shall try to probe into the background of Peter Grubb and try to explain his success

as iron master. The Grubb family came to America from England, quite early in the growth of America, arriving in 1692.¹ The Grubb clan landed along the Delaware coast at a spot known later as Grubb's Landing.² While the family lived in Grubb's Landing, John Grubb (father of Peter Grubb) built and maintained a tannery to become one of the first tanners in this young province of Pennsylvania.³ John Grubb and his family remained in Grubb's Landing till about 1703, in which year Grubb moved with his family to Marcus Hook, Pennsylvania.⁴ The Grubbs lived in Marcus Hook, when Peter was born in 1707, to John and Francis Grubb.⁵ John was very successful in his business ventures in the vicinity of his home town, because by the time of his death in March, 1708, John had acquired quite a bit of real estate.⁶ Following the death of John Grubb, the holdings were turned over to his family. Gilbert Cope stated in his account of the **Grubb Family**, that following this time the Grubbs moved to Bradford Township, but the evidence supporting this statement is rather vague especially as to the time of the moving to the family.

Peter Grubb had by this time become old enough to give some thought to his future vocation, for it was about this time that Peter was contracted as an apprentice to learn the trade of stone mason. Grubb never had an extensive formal education but he must have mastered well the trade of mason. This phase shall be discussed more fully later in this writing. I think that there can be little doubt that Grubb made a long upward climb, with the aid of what he had at hand, mainly an alert and keenly perceptive mind.

In 1726 in the township of Kennett, we find Grubb appearing on the tax list as a single freeman.⁷ In 1735 the name of Peter Grubb appears on the tax list of East Caln.⁸ It appears that Grubb was moving about in quest of his status of a man of the times, and trying to find his place in the march forward of the growing colonies.

But what of the personal life of Peter Grubb? On November 3, 1731, he was accepted into the membership of the Friends.⁹ Also on November 3, Peter declared his wish to marry Martha Wall. However the marriage was delayed for a time, for Grubb had been stricken with small pox.¹⁰ The marriage although delayed finally took place December 2, 1732 at Caln Meeting.¹¹ Among the people attending the wedding were the following: Samuel Grubb, Nathaniel Grubb, Phebe Buffington, Ann Grubb (relatives of Grubb); John and Joseph Wall (relatives of Martha); and friends; Mary Bates, Charity Beeson, John Beeson and John and Richard.¹² The marriage lasted till 1740 when Martha's untimely death ended it.¹³ Grubb remarried the following year in Concord Meeting, on December 10, 1741 to Hannah Marshall, to whom he was married the rest of his life.¹⁴

The trade of stone mason, which Grubb studied as an apprentice in his younger years, was first used by Grubb on March 1, 1726. It was on this date that Grubb agreed in a contract to build for Samuel Marshall on the land of Abraham Marshall a corn mill and mill house. The cost of building the corn mill and mill house was set at £212. The details of this first venture for Grubb are found in the following contract:

Peter Grubb shall and will within the space of Two years next after the date hereof in Good and workmanlike manner and according to the Best of his art and skill, Build Erect Set up and finish (Upon the land of

the s'd Abraham Marshall in Bradford aforesaid) one water corn Mill and bolting mills and a Good and Convenient Mill house of such Dimensions and such partitions floors and Divisions therein for the holding Boulting and Managring of all sorts of grain as Shall be agreed upon by the said, "in consideration whereof the said Abraham Marshall shall agree to pay the sum of £140 and upon the completion of the said mills to "Convey and assure unto the s'd Peter Grubb his heirs and Assigns for ever The one full Equal and Undivided Moiety or half part of the said water Corn Mill Boulting Mills and Mill House of all the land which the s'd mill and house mill race or races and Mill dam shall be in and upon together with one full moiety of all the ponds Banks Streams and appurtenances whatsoever thereunto belonging; "and the said Peter Grubb doth covenant that he shall and will lay out and Expend the said sum of One Hundred and Forty in and about the Building Erecting and Setting Up (in the place aforesaid) the best water corn Mill Boulting Mills and Mill house that can be built and Erected for the Augmenting the Respective Estates of them the s'd parties and not otherwise."¹⁵

The above contract was fulfilled by both parties and the following receipt was sent by Grubb to Marshall. It read as follows:

Receipt of P. Grubb to Abraham Marshall

"In fould satisfaction of all clauses contreverces or agreements whatsoever in a sartain articall between ye said Abraham Marshall and Peter Grubb bareing the Dait the first day of march of the year of one thousand seven hundred and twenty six."¹⁶

With the completion of the mill and the mill facilities, which showed the ability of Grubb as a builder, he turned his interest and energy to being an iron master.

Perhaps in the light of the circumstances we can see a man molded, able to cope with the vast problems in the integrating of many factors to produce a finished product. His background in masonry was undoubtedly of great significance in the forming of a means of using what was at hand to work with.

In writing this next portion of this paper one question stands out rather pointedly. Why wasn't this vast deposit of iron ore developed before this time? In the accounts I have read none of the authors have dealt with the question. Perhaps among the following we can find the answer. One possibility would be Indians. At this early time the area must have been very wild and forbidding and certainly not a healthy place to meet an angry Indian. A second reason could be that the deposit was not accessible from outlying areas. This may be a reason. I don't know when the Horseshoe Pike had its origin but without it, there were undoubtedly little more than trails into the deposit. A third possibility would be that the people simply didn't know of the presence of the ore. But in further consideration I believe this proposition could be discarded also. Most early accounts state that the ore lay very close to the surface. If this were true I should think that some ore would have been exposed to the probing eye above the surface. Here again, another factor arises. Perhaps with the British imported iron products, the need wasn't pressing enough to call for close exploration for additional ore deposits. A final possibility would be that the former owners had known of the ore deposit and simply didn't possess the ability to exploit it properly. However, this chain of speculation comes to a halt with the purchase by Grubb of the land making up the Cornwall Ore Banks. Grubb was aware of the presence of the ore and had given quite a bit of thought to its smelting.

Perhaps at this time it would be good to trace the chain of ownership of the Cornwall Ore Banks up to the time of Grubb's purchase. The first owner following the Penn's was John Turner. Turner bought a tract of 5000 acres from Thomas, Richard and John Penn for the sum of £500 in Pennsylvania currency on May 8, 1727¹⁷ The tract of land was later passed from John Turner to William Allen.¹⁸ In 1733, Grubb started a purchase of 200 acres of land from Mrs. Allen, widow of William Allen, finally on November 2, 1734 he received full rights to the land.¹⁹ When Grubb saw the possibility of the property that he had bought and the richness of the remaining land, he made additional purchases to take in the ore rich property. On November 6, 1734 Grubb received rights to 200 acres adjoining the first purchase. Again on November 30, 1737 Grubb bought 300 acres for £135 from Mrs. William Allen.²⁰ Grubb purchased again on August 2, 1745, this time from Mrs. Wm. Allen, an area of 300 acres.²¹ This piecemeal buying of Grubb continued until finally he owned several thousand acres of woodland. The woodland that Grubb bought centered around the three hills of iron ore. These are called Large Hill, Middle Hill, and Grassy Hill.

With the establishment of Grubb as the sole owner of the area containing the necessary materials, he faced the problem of building the necessary facilities for the processing of the iron ore, which was so near at hand. A Grubb family tradition states that Grubb didn't build Cornwall Furnace first, but rather a small bloomery near the present site of the furnace. The date given is about 1735. This family tradition has been strengthened by the discovery of pieces of white iron found near the site of the bloomery, the discoverer of this evidence was H. C. Grittinger.²² The start of the building of Cornwall Furnace was in 1739 as is stated in the following contract.

Contract for the Building of Cornwall Furnace

"On the 22nd day of September in the thirteenth year of the reign of King George the Second over Great Britain, France, and anno Moni 1739, between Peter Grubb of the township of Warwick in the county of Lancaster of the Province of Pennsylvania, Iron Master, with Samuel Grubb of East Bradford, in the county of Chester, a charcoal Furnace to be built and to be called Cornwall.²³

The Furnace was in operation by the year 1742 and was managed by Grubb. The operation of Cornwall was quite satisfactory to Grubb as is shown in a note to his sister Phebe.

Respected Sister Phebe Buffington, Please to send me by ye Bairer Hereof Lohlon McGrady, my two oxen and we are well at Present. These with respect from thy Friend and Brother

ye 24 the of ye 3mo, 1743

noate and we shall Blow tomorrow and we Believe our selfs to be in good Surscumstahse for a good Blast.

P. G.²⁴

Grubb, himself, ran the Furnace from 1742 till 1745. On June 11, 1745 he leased the company, which included the furnace, 650 acres of land, Hopewell Forge and 218 acres of land for 20 years at £150 per year, to twelve men, who ran the Furnace under the name of the Cornwall Company.²⁵ The Cornwall Company after a few years discontinued operations and the lease was taken over by a Quaker from Baltimore, Jacob Giles, who operated the furnace till the lease expired.²⁶

The operation of the furnace was quite a task, involving much back-breaking work. The only fuel used in the operation of the furnace was charcoal, but this was needed in great quantity; to produce one ton of hammered iron from ore requires about 400 bushels of charcoal.²⁷ Also necessary in the operation is a "cold air blast." This was supplied by two large leather bellows powered by a large water wheel. Thus the need of a never failing stream of water, which is present near the furnace. The fourth and final ingredient vital to the process is limestone, of which there is a sufficient amount near the furnace site.

The site of the furnace is very advantageous to its operation and seems to show a great deal of foresight in its selection. The furnace is placed against the side of a hill, the top of the hill being about level with the top of the furnace. Thus the materials could be moved in, weighed and placed into the furnace, without lifting of any kind. This design undoubtedly saved much labor and time and contributed to keeping the price of the finished product lower.

To acquire skilled laborers to conduct the operation of the Furnace presented somewhat of a problem. However this region was populated by an industrious people mostly of a German background. The acquisition of these skilled workmen wasn't too difficult, however, in time of a crisis it often proved a problem to hold them in the Furnace's operation. For example, during the Revolution, Peter Grubb Jr. placed a request for exemption for the men working at the furnace. Grubb appealed to the Council of Safety on Thursday, October 30, 1777.

Colonel Grubb Represented to the Council that his Furnace is now in blast for the purpose of Casting Salt-pans and that the blast cannot be continued without the assistance of Thomas Edwards—manager; David Short—founder; John Campbell and John Forster—colliers; and John Peters—carpenter; that these men now ordered, must March without the particular order of this Council; on consideration **Ordered** That the said Thomas Edwards, David Short, John Campbell, John Foster, and John Peters who are employed at Grubb's Furnace in Casting Salt-Pans for the making of Salt be permitted to continue at the said furnace until the said salt-pans be compleated, and that they then proceed to Camp with all expedition, and serve their Tour in the field.²⁸

Also found in the records of the Council of Safety is the following article.

Nov. 26, 1777 Council of Safety

It being represented to Council that Thomas Edwards, Manager of Col. Grubb's Furnace, has gone into the field.

Ordered That Hugh Lusk, who is employed as Manager at Grubb's furnace, in casting Salt-Pans for the making of salt, be permitted to continue as the said furnace until the said Salt-Pans be compleated, and that then he shall proceed to Camp with all expedition, and serve out his tour in the field.²⁹

Besides owning the successful Cornwall Furnace, Grubb owned several other iron manufacturing and processing plants. Hopewell Forge was built by Grubb at about the same time that Cornwall was erected.³⁰ Grittinger states that there were really two Hopewell Forges, one transformed the iron into blooms, a bloom being a lump of wrought iron in the form that it assumes on coming from a forge. The second forge reheated the irregularly shaped blooms and hammered them into the bar iron.³¹ Along the Hammer Creek near Brickerville in 1750, Grubb built Speedwell Forge.³² Upon the death of Peter Grubb Sr. on June 28, 1783, his estate was ac-

ording to custom given to his sons, two thirds to Curtis the elder and one third to the younger son Peter II. Grubb passed to his sons a very impressive estate of over 9669 acres of land including: Cornwall Furnace and Mines, Hopewell Forges and Speedwell Forge.³³

The operation of Cornwall Furnace previous to the Revolution was not specialized to one particular field of manufacturing. On the evidence found in the ledgers and the daybooks of the Furnace for this period it is shown that the chief products of the Furnace were bar iron and pig iron. They turned out various other products on a small scale among these are found: nails, sledge hammer heads, wedges, and wagon wheel rims. A product found at most of the early furnaces was the stove plates and Cornwall was no exception. Manufactured in 1765 was a stove plate on which the German inscription "Bey Got Ist Mein Heil Cortus Grob For," or "God is my Salvation, Curtis Grubb Furnace."³⁴

Curtis Grubb was a colonel in the local militia, in addition to his duties at the furnace and mine hills. Curtis was very successful in his business and military careers, unfortunately his marriage wasn't as successful. The following will illustrate this point:

Committee of Assembly Jan. 27, 1769

There was laid before the Board a Bill sent up by the Assembly for the Governors concurrence, entitled "An act to dissolve the Marriage of Curtis Grubb, of the County of Lancaster, Iron Master, with Ann, His wife, late Ann Few, and to enable him to Marry again.

referred to further consideration

The board was informed the Governor desired further proof of the facts in the case.

Feb. 10, 1769

Committee of Assembly passed an amendment.

(Curtis Grubb) may contract Matrimony with and take to Wife any other Woman during the Natural Life of the said Anne, in the same manner as he might or could do if she, the said Anne was actually dead, and such marriage, when had and solemnized, shall be, and is hereby declared and adjudged to be good and legal to all intents and purposes.

Feb. 18, 1769

Passed—An act to dissolve the Marriage of Curtis Grubb, of the County of Lancaster, Iron Master, with Ann his wife, late Ann Few), and to enable him to marry again."³⁵

Thus we see the power of marriage vows in the days of the 1700's.

Even though the Revolution was not under way at this time, the Grubbs must have been planning to start the manufacture of arms, because Peter Grubb II on April 30, 1776 drew £10 to pay for his waiting in Philadelphia to meet a gun founder.³⁶ I found no evidence in the records as to the outcome of this meeting. The breath of the Revolution was already stirring in the hearts of the men in the colonies. After the war had started, on August 31, 1776, £205 was charged to T. Paine for expenses and operation of the Furnace.³⁷ After several of these charges against Paine, he wrote a letter to Grubb protesting the excessive operation costs of the Furnace.

Philadelphia 18 September 1776
"to Colonel Grubb"

"Sir—By Captain Joy I understand you have at last made some 12-pounders, but I fear they are heavier than they ought to be. Those made by Colonel Bird weight bu 27c and some under.

"You have drawn on the Committee for £1500, it is not sent because the matter is not understood. We can't suppose you want such a sum to carry on the Works and you certainly don't desire the Cannon to be paid for before they are delivered.

"The sum you draw for is the value of the Guns already made, and as the contract was made with your Brother, Col. Curtis Grubb (Tho' you may be equally interested with him), yet I should like to hear from him before so large a sum was paid; however, I have sent you by Captain Danl. Joy one thousand dollars. I mentioned to Congress your inclination to have some of the prisoners from Lancaster to work for you, but it was supposed the Committee of Lancaster would object to it. I hope you will make all expedition in making the Cannon and getting them down, for they are much needed.

"The Cannon must be proved with two shott, or they will never be put on board the Ships. I am your Hum'l Serv't."

R. T. Paine³⁸

The objection to payment to Grubb for the cannon probably was based on the shortage of money controlled by the newly formed government.

Once the manufacture of cannons had started and shipments made, the manufacture moved in spurts. On October 26 and 27, 1776 £5 was paid to John Smith and George Zinn, in that order, for hauling cannon to Philadelphia and in November on the 2nd and the twelfth, Christ Sangry and Henry Minike were also paid £5 for their services.³⁹ On December 14, 1776, Cornwall received money from Paine and Congress, £1000 instead of the £1500, Grubb had originally asked of the Congress.⁴⁰ At Cornwall not only cannons were cast, on December 20, 1777, the Continental Congress paid £125 for ton of small stove plates.⁴¹ Quite a number of salt-pans used in the processing of saltpetre (necessary in gunpowder) were produced at Cornwall during the Revolutionary period. On December 13, 1777, Thomas Edwards was paid £108 and 10 shillings for 2 tons of salt-pans that he had cast at Cornwall.⁴² While going on what was produced at Cornwall, I would not call it the arsenal of the nation, Congress must have considered it of some importance because again on April 11, 1778 £125 was received to help finance the operation to the Furnace.⁴³

During the days directly before the Revolution and the days following, the original furnace that Grubb had founded underwent several transitions. The first major change was that of ownership; previous to the death of Peter Grubb I it was under a sole owner. This condition changed at his death when his estate was passed onto Curtis and Peter II. The importance of this change lies in the fact that with more than one owner, there is a good chance that the estate will split to divergent views as to its handling. The complicated tangle of ownership with its baffling distribution of equities is described in detail in the famous case of Coleman vs Grubb.⁴⁴

The other major change in the Furnace's status is with the products it turned out. Before the Revolution, goods were mainly of a domestic nature; nails, wheel rims, sledge hammer heads, and wedges; however as all things change during War, thus the goods turned out became cannons and salt pans. The story presents a rather ironic twist in that the same equipment be used on one hand to turn out stove plates inscribed with Scripture and on the other to produce cannons and munitions for

use in the fighting of a war. Following the Revolution things returned to the old pattern centered around the manufacture of pig and bar iron, much of which was sent to be processed at Hopewell. The Furnace's operation was as a mirror reflecting the conditions and the mood of the times.

Before progressing to the next portion of this writing we would do well to acquire a clear picture of the portions to be found among the original holdings of the Grubb estate. These are the descriptions given in the case of **Coleman vs. Grubb**.⁴⁵

Description of Martick Forge Estate

Containing 300 acres and the usual allowance of six per cent. for roads and highways, whereon erected a dwelling house and barn, a forge called "Martick Forge", and all the buildings necessary for and appurtenant to Iron works, together with a steel furnace; and the said five described tracts or parcels of land composing the Martick estate, and containing in the whole 5560 acres and 80 perches, and the usual allowance of six per cent. for roads and highways.

Description of the Colemanville Estate

The said six several last described tracts or parcels of land containing together and in the whole 3000 acres and 54 perches, and the usual allowance of six per cent. for roads and highways, compose the estate known by the name of Colemanville whereon are erected a dwelling-house and barn, a forge rolling mill, nail factory, and all the out buildings necessary and appurtenant to Iron Works of this kind. The said estate being subjected to and charged with the payment of the sum of \$20,000 at and immediately upon the death of Mrs. Dorothy Brein, to and among the heirs and legates of Edward Brien, Esq., the interest thereof to be paid to her semi-annually during life.

Description of Elizabeth Furnace

Which, with the next fourteen described tracts of land constitute the estate called "Elizabeth Furnace" on which are erected a dwelling house, barns, stables, and other out houses, a Furnace called Elizabeth Furnace with all the tenant houses, coal houses and other out buildings necessary for or in anywise appertaining to Iron Works, with all the rights, privileges and immunities thereto belonging or in anywise appertaining, and a right to take ore or mine from the ore banks and mine hills situate on said estate, partition of which ore banks and mine hills is expressly excepted by the demandant, so that the same may remain a tenancy in common, according to the respective rights of the parties in interest.

Description of Speedwell and Hopewell Forges

Containing together 3188 acres and 141 perches, and allowance of six per cent. for roads, partition whereof between them according to the laws and customs of this Commonwealth in such cases made and provided, they do gainsay and the same to be made do not permit, very unjustly and the laws and customs.

Now that we have been exposed to the word description of the holdings involved, perhaps we can visualize the breadth of the various estates. The singular ownership of Cornwall came to an end June 28, 1783.⁴⁶ It was on that date, that Peter Grubb Sr. died and the estate was conveyed to Peter II and Curtis. The title of proprietor became plural, with Peter II receiving one third of the estate and Curtis the elder receiving two thirds of the estate.⁴⁷ It was the custom of the day for the older son of the deceased to acquire the lion's share of the remaining estate. The estate of Peter Grubb encompassed 9669 acres and included in its domain; Cornwall

Furnace, Hopewell Forges and Cornwall mine and hills, known as a whole by the name of **Cornwall Furnace Estate**.⁴⁸

We have seen how Peter and Curtis operated the Furnace during the Revolution, now we can examine the operation following the conflict. Curtis on June 28, 1783 deeded to his son Peter Jr. one undivided sixth part of the Cornwall Furnace, with its appurtenances, and the one undivided third part of the Hopewell Forges.⁴⁹ Thus the Cornwall Furnace Estate was owned by Curtis, Peter and Peter Jr. (son of Curtis). However, this condition was not to endure for a long period of time. This combination of owners was to terminate on September 26, 1785. It was on this date that Peter Grubb Jr. entered into an agreement with Robert Coleman, an ironmaster of Elizabeth township. The agreement read as follows:

one sixth of Cornwall Furnace
one third of Hopewell Forge

saving and excepting unto the said Peter Grubb Jr. his heirs and assigns forever, the right, liberty and privilege, at all times thereafter of entering upon the premises thereby granted and released and of digging, raising and hauling away a sufficient amount of iron ore for the supply of any ore (one) furnace, at the election of Peter Grubb Jr. his heirs and assigns, at all times thereafter.⁵⁰

Also attached to the agreement was a covenant allowing Robert Coleman, "to enter and upon the premises, and cut wood, raise ore, dig, load and carry away." The main object of the agreement by Robert Coleman was stated in the case of **Coleman vs. Grubb**. It was for the acquisition of ore for Elizabeth Furnace that Coleman made the agreement. Previous to this time Coleman received ore from Gorde's bank, but the ore was of low grade and difficult to dig out. On May 9, 1786 Peter Grubb Jr. conveyed to Robert Coleman one third of Hopewell Forge and one sixth of Cornwall Furnace and ore banks. To the agreement Grubb added the following clause: saving and excepting unto Peter Grubb Jr., his heirs and assigns forever the right, liberty, and privilege at all times thereafter, of entering upon the premises thereby granted and released and of digging, raising and hauling away a sufficient amount of iron ore for the supply of any one furnace, at the election of Peter Grubb Jr. his heirs and assigns, at all times thereafter.⁵¹ With this agreement and its conveyance the Cornwall Furnace passed out of the hands of the Grubb's for the first time, even if only in part.

The owners of Cornwall also held other iron interests; Robert Coleman—Cornwall Furnace, Peter Grubb—Mount Hope Furnace, and Curtis Grubb, Robert Coleman and Peter Grubb held in common Cornwall Furnace Estate. Thus the ore taken from the banks was proportional to the business of the respective furnaces and forges. This joint ownership of the ore banks continued till December 8, 1785, when an agreement was made for the partition of the ore banks. The following men were selected to make the partition—Joseph Thornburg, Thomas Clark, Alexander Lowry, Samuel Atlee, James Clemson, James Webb and Bartram Galbraith.⁵² Before the agreement was carried out Peter Grubb died. January 21, 1786, he passed his holdings to his sons, Burd Grubb and Henry Bates Grubb in equal shares. However, both sons were minors and these men were appointed their guardians: Jasper Yeates, James Clemson, Joseph Shippen Jr.

and Edward Hand. The agreement to partition the ore banks was entered by the guardians on May 6, 1786 with Robert Coleman and Curtis Grubb.⁵³ The action of partition was placed in the Court of Common Pleas in Lancaster County of May term in 1786. Samuel Potts, Thomas Clark, Alexander Lowry, George Ross, Joseph Work, James Webb and Bartram Galbraith to allot the ore in equal shares. The partition was to consist of three equal shares, two to go to Curtis Grubb and Robert Coleman, and the other to go to Burd and Henry Bates Grubb. Hopewell Forges were to pass to Curtis or Burd and Henry Bates Grubb. All land belonging to the Furnace estate was allotted to all three parties of the agreement. Cornwall Furnace was to pass to Curtis Grubb and Robert Coleman.⁵⁴ After the appointed group of partitioners for more than a year had studied the agreement, it concluded on August 30, 1787 that a just and equal division couldn't be achieved. The parties to the act of partition agreed to a new agreement on August 30, 1787. A portion of this compromise follows:

Whereas it had been found on the fullest investigation that the agreement entered into between Curtis Grubb, Robert Coleman, and the guardians of the minor children of Peter Grubb deceased, cannot be carried into execution without the greatest injustice to some of the parties, and the same having been so represented by the parties so represented by the parties appointed in the said agreement to make partition.

Therefore to remove all difficulties, in pursuance of this recommendation, it is mutually agreed between the said parties, that the persons placed in the said agreement, substituting Joseph Thornburg in the place of Samuel Potts, shall make equal partition of Cornwall Furnace, Hoepwell Forges, and all the lands, plantations, houses, and other real estate, late the property of Curtis Grubb and Peter Grubb, according to the real interest and convenience of the several places.

Provided always, and it is hereby agreed, that the ore banks belonging to Cornwall Furnace, shall remain together and undivided as a tenancy in common, the said Curtis Grubb being entitled to three sixths parts thereof the said Robert Coleman being entitled to one sixth part, and the said minor children being entitled to the remaining two sixths thereof, and that for this purpose an accurate survey shall be made of the said ore banks and mine hills, if not already done. And it is hereby declared to be the true intent and meaning hereof, that neither of the parties, their agents or workmen, shall interfere or interrupt either of the other parties at any mine hole by them opened and occupied for that purpose of raising iron ore.

Additional Agreement

Whereas, it hath been suggested, the article respecting the ore banks and hills, requires further explanation, and that it may so happen that veins of ore may extend beyond the limits of the survey made by Thomas Clark, it is hereby expressly declared and agreed, that the said Burd Grubb and Henry Bates Grubb, and Robert Coleman, and their respective heirs and assigns shall have full liberty and privilege of ingress, egress and regress to and from the said mine hill, and shall have free and uninterrupted liberty and power to dig and sink shafts, drive shafts, raise and carry away ore that may be found to extend beyond the limits of the said survey, without doing any material damage to the iron works or plantation.

It is hereby declared that the tract of land called Bingham's tract, shall remain undivided for the present.

On August 31, 1787 the above agreement was confirmed and put into effect. It assigned Cornwall Furnace to Curtis Grubb, and Robert Cole-

Examined in chief

John Shay was master miner when I went there.

The ore in the different hills is of different kinds and qualities. To make good iron, it is understood by the founders to be necessary to have ore from each hill. John Shay was master miner for the Coleman's for Elizabeth, Cornwall and Colebrook; as founder he had selection for ore for some time before that. He was the brother of Thomas Shay, who was examined yesterday. He was the master miner for the Colemans all his lifetime. The trap rock can generally be seen on the surface. Sometimes we came upon it unexpectedly; sometimes a vein of ore of a peculiar kind runs out, sometimes gets better, sometimes worse. Sometimes it gets bad, and we have to leave it. Sometimes it is mixed with sulfur. The surface ore is the best, it is supposed that by exposure the sulfur is carried away.

Cross-examined

Elizabeth Furnace has no opening in the Grassy hill. It is occupied by Mount Hope, Colebrook and Cornwall. They prefer to have the ores from the different hills. They sometimes mix the ore from different holes on the same hill, but count it an advantage to have ore from different hills. There is sulfur in the three hills. To the best of my knowledge no party has taken from the hole of another for the last 30 years.

Re-examined in chief

Elizabeth has the greater part of the western part of the middle hill. John Shay was master miner when these openings were made, and because Elizabeth had none on Grassy hill, he gave them a large part of the western side of Middle hill. These openings were made about 22 or 23 years ago. Elizabeth also has openings in the Big hill. I could point out the different holes belonging the different furnaces. The middle hill, so far as there is known to be ore, is occupied and taken up. The hands of either, under the direction of the master miner, open the ground when they think proper, and draw lines for the purpose of defining their rights drive canals and big drifts. They divide and make lines when neighbours approach. The grassy hill is also taken up. There are parts of Grassy hill not taken up, because there is no ore there being full trap rock. Big hill is the same way, being not so well defined as the other hills. I could point out the different holes of the parties in Big hill. The parties do not use the ore of that hill much. Grassy hill is about 75 feet high.⁵⁶

The following is the testimony of Thomas Shay.

I have been conducting ore in the Cornwall ore banks, and have been acquainted with them 65 years. I hauled ore for Henry Bates Grubb—for Grubb I hauled to Mount Hope 55 years ago. To the best of my knowledge, once a hole had been opened, it was always a hole for the party opening it. The holes were called by the names of the furnaces they belonged to. The parties were not allowed to interfere with each other by the rules and laws of the hills in opening holes and mining ore. The dirt was wheeled to one side of the hole, and belonged to the party opening the holes. The holes were made commencing a hole on the foot of the hill and dig in, and if they found good ore, they dug to the right and left, if there was no hole to interfere with them. When I hauled for Mount Hope, I hauled from Grassy mine hill, and the back of the big hill. I have been there for 24 years. Length of canals—some 100 yards—some 200 yards, according to the quality of ore. Mount Hope has three or four holes in the middle, and one or two in Grassy hill, and three in Big hill. They have had these holes 24 years and more. They work in them occasionally. They quit sometimes for half a year, and take from another hole. The average of the holes is, from a quarter to half an acre. I can't tell all the Cornwall holes, or how many they have. We have separate holes for Reading Furnace. I took possession and opened them. Some of the holes I opened had nothing but sulfur and copper.

man, an estate which contained about 6520 acres. To Burd Grubb and Henry Bates Grubb it assigned the Hopewell Forges, which contained about 3741 acres in all. Concerning the ore banks: "and we do further report that the tract of land called Bingham's place, at Connowage, together with a small tract of forty acres of land adjoining thereto, and also the ore banks and hills at Cornwall Furnace, do still remain undivided, to be held by the said Curtis Grubb, Robert Coleman, Burd Grubb and Henry Bates Grubb, as tenants in common according to their respective shares, and to the covenants and articles in the said agreements hereinbefore contained."⁵⁵

The joint ownership of the ore banks proved to be a workable solution to the problem of possession of the ore deposit. No one person had complete control of removing the rich ore. Each furnace had its own mine holes, the hole bore the name of the operator; such as Elizabeth Furnace hole. Once a hole was started, it belonged to the party, who started the excavation, this held true even if the hole were abandoned for a long period of time. For further information of how this arrangement worked we shall look into the testimony found in the case of **Coleman versus Grubb**. The first man heard on the stand was James Kennedy.

I am a master miner for Robert W. Coleman and William Coleman; I have been master miner for 16 years, and for 7 years before that I worked on the hills. Each furnace had its own holes, which are called by the names of the furnaces. Interferences are not allowed. I have known the Mount Hope holes ever since I worked on the hills. They claim and hold these holes. Sometimes they are idle. This the rule which governs all parties-if a hole is left idle, the other parties do not occupy it. The roads do not pass over these holes. Generally each hole has its own road. The highest hill is supposed to be about 300 feet high. There is trap rock on the north side of middle and Big hill. The south sides of the hill have sandstone. We generally leave the rocks stand when we get to meet them. We can work over each other in some parts of the hill. We generally rise in mining and digging. When the lower furnace comes to the upper one, it must. In the middle hill we work up to the Ridge. That is the place where we stop by the rules. Twenty years ago the Big hill was all occupied. We now work the dirt over. Each furnace now claims the ore in the dirt they carries out of the respective holes. We (Cornwall and Colebrook) have holes that have not been worked for 15 or 20 years.

That is the rule and custom of the other furnace. It is the business of the master miner to see that these are not occupied by the others.

Mr. Fassit, was at Cornwall in 1829, and before.

Cross-examined

The holes, when necessary, are used as roads by all parties. The middle hill has been operated within 23 years, but before 21 years. It was understood by every person on the hills, that the holes opened by us, we could claim and use when we wanted. Sometimes, to keep a hole, we have gone and worked a little. The Messrs. Grubb have several holes, that have not been worked for the last two or three years. It would hardly be possible define the boundaries of a hole, they enlarge from year to year. Where two parties are driving alongside, they run a line in front and then run ahead. The owners have never interfered to prevent this. But the owners have interfered to settle dispute and run lines. Mr. James, William and Burd Coleman, and Messrs. Grubb have so made lines and boundaries. These lines were defined for the sake of peace.

Mount Hope had a hole on the south side of the turnpike more than 23 years ago.

Sometimes they (the miners) interfered, and we then compromised, and each kept what we had.

There are rocks or kind of iron stone, that we meet veins of copper also. There is but a small space left unoccupied except what is stoney. There is very little vacant ground for new holes. I could not find a place for new holes—must occupy old ground occupied long ago. The surface is very poor ground. The furnaces all used charcoals in the old times. Large bodies of woodland belonged to the Furnace to keep them a going.

Cross-examined

The rule and law of the hill was, that any furnace opening a hole, that would belong exclusively to the party opening it. The rule was made, as far as I can Understand, by Wm. Coleman, and Henry Bates Grubb. I got the law from my brother John. That was the rule of the hill. John was superintendent for Cornwall, Elizabeth and Colebrook; it was a rule when I came there. There are places where one furnace has a hole higher up the hill than another—but they never interfered with each other's holes. There are holes on the opposite sides of the hill which, when the hill is good they spread, but not so as to interfere. I have no recollection of one party taking possession of a hole belonging to another party. I dug in the middle and big hills, I never worked on Grassy hill. Cornwall, Colebrook, and Mount Hope, have holes on the Grassy hill. Elizabeth had none. The Grassy hill is nearly all occupied. The ground near the holes used by the teams, in carrying ore away from the hills. Some of the holes have been extended over a hundred feet. Forty years ago, there were very few holes. Twenty one years ago there weren't so many holes by half as there are now. They have been extending in width and length all that time, but so as not to interfere with the holes of others. There have been holes left idle for a year at a time, sometimes for three or four. I have left holes and gone to others that had a better quality. Messrs. Grubb opened three or four holes within twenty years—generally in the middle hill.

The following is the testimony of William Fassit.

I have known Elizabeth, Mount Hope and Cornwall Furnaces since I had a little boy. Mr. Coleman got his first ore at a place called Gordy's ore bank, before he got Cornwall. It was stubborn and hard to get; it laid low, and the water got into it, after he got interest in Cornwall estate, he got the ore from Cornwall hills, then called Grubb's hills. I have lived with the Colemans ever since I was a little boy. I was well acquainted with the hills. I was there every few days. Every party had their separate holes—Mount Hope holes, Cornwall holes and Elizabeth holes. They were called after the respective furnaces. They were held separate. Sometimes the hands would dispute. Wm. Coleman told me about a dispute. Wm. Coleman complained that they intruded upon his mine hole. The Mount Hope workmen were driven away from this hole of Wm. Coleman. The holes were commenced on the lowest ground, and were dug in, and were called Drifts. The drifts put outside of the holes. I cannot tell how many holes Mount Hope Furnace had, they always claimed the right to occupy them again. Sometimes the ore ran against the rock. There is sulfur and copper—sulfur ore is thrown away.

Cross-examined

It was always considered that the hole abandoned belonged to the party who had opened the same. I cannot tell how long any one hole was occupied. I cannot tell the length, height or breadth of any of these holes. The different parties may have the holes one under the other. There were roads across the hill, and they are used by the parties or owners. I never heard of their taking each other's ore. I was clerk of Cornwall, Colebrook and Springs Forge.

When the previous testimony is placed under a more concentrated study, it yields a very good picture of the methods and rules employed

partly in Rapho Township, Lancaster County, partly in Lebanon Township, Lebanon County, bounded on all sides by lands of Thomas B. Coleman, the heirs of Christian Rhule, and others, containing one thousand seven hundred and eighty-nine acres, with a furnace, thereon erected.

Another estate, the one undivided sixth part of three certain mine hills, situate in Lebanon Township, Lebanon County, bounded on all sides by lands of Thomas B. Coleman, and known and called by the name of Cornwall ore banks, and held as a tenancy in common with Thomas B. Coleman and the heirs of James Coleman, deceased, which said several tracts of land and ore banks constitute the estate called Mount Hope.

Judgment was entered. Inquisition and appraisement of the estate returned. The estates were taken and allotted to Edward B. Grubb and Clement B. Grubb, of the 13th of June 1836.⁵⁷

The partition of James Coleman, deceased.
Orphan's Court of Lancaster County

Petition of the legal representatives of James Coleman, deceased, viz. Harriet Coleman, the surviving parent of the five children and heirs of said deceased. Robert Coleman, George Dawson Coleman, Anna C. Parker, Sarah Coleman, and Harriet Coleman, the two latter by their guardian, the aforesaid Harriet.

The undivided right, title and interest held in fee by the said James Coleman at his decease, as tenants in common with them, of and in the lands, tenements and hereditaments which contain ore of iron and other metals, devised, as by reference to those will more clearly appear. The lands, tenements and hereditaments known as the Elizabeth Furnace estate, situate in the counties of Lancaster and Lebanon, and composed of numerous tracts, in all containing together, with certain pieces attached, purchased since the decease of the intestate, about 11,492 acres 82 perches, and allowance, the lands, tenements and hereditaments known as the Martick Works and Colemanville Works estate, situate in the county of Lancaster.

Another estate situate and known and called by the name of Martick estate, and composed of the following tracts of land.

Another estate, situate and known and called by the name of the Colemanville estate, and composed of the following tracts of land.

An estate, partly in said county and partly in Lebanon County, known and called by the name of Elizabeth Furnace, composed of the following tracts of land, and bounded and described as follows: (The tracts here described by metes bounds, courses and distances.) Containing 10,085 acres and 91 perches, the usual allowance of six per cent for roads, which, with the next fourteen described tracts of land, constitute the estate called Elizabeth Furnace, with all the tenant-houses, coal-houses and other out-buildings, necessary for or in anywise appertaining to Iron works, with all the rights, privileges and immunities thereto belonging or in anywise appertaining, and "a right to take ore or mine from the ore banks and mine hills at Cornwall,"

March 19, 1849 Inquisition read

Robert Coleman, eldest son and heir at law of James Coleman, deceased, elects to take the whole premises described in the said return of inquisition, at the valuation made thereof, in his own right, by agreement, for the use of himself and only brother, George Dawson Coleman, in common and in equal parts and interests.⁵⁸

It appears from the above records that the partition of holdings was more complex than the actual operation of the ore banks. As of the year 1836, the owners and their proportion of shares were as follows:

Elizabeth Furnace, with its appurtenances, become vested in the plaintiffs, Robert Coleman, and George Dawson Coleman.

Cornwall Furnace, with its appurtenances, in Robert Coleman one of the defendants.

Colebrook Furnace, with its appurtenances, in William Coleman, one of the defendants.

Mount Hope Furnace, with its appurtenances, Edward B. and Clement B. Grubb, the other two defendants. And the estate and right reserved in the deed of the 9th of May of 1786, from Peter Grubb to Robert Coleman, by a regular chain of title in Henry P. Robeson and Clement Brook who are the owners of Reading Furnace, for the supply of which with iron ore they used in the same.⁵⁹

The arrangement of individual parties owning the digging, which they worked or had worked at one time or another. The working by private parties ended with the organization of the Cornwall Ore Banks Company on January 14, 1864.⁶⁰ The following parties were listed as proprietors and also the proportion of the lands they owned.

Robert Coleman	25/96
Robert H. and Anne represented by Samuel Small	25/86
Robert Coleman	15/96
G. Dawson Coleman	15/96
Edward Grubb	8/96
Clement Grubb	8/96
Robesonia Furnace White and Ferguson—amount needed to operate their furnace.	

Addresses of the Proprietors

Robert W. Coleman—Cornwall, Penna.

Samuel Small—York, Penna.

R. C. McMurtrie

att. for Robert Coleman—416 Walnut St., Phila.

Dawson Coleman—Lebanon, Penna.

Edward Grubb—Burlington, N. J.⁶¹

The proprietors elected Samuel Small to the presidency of the Company they had formed. Small's term was to extend from January 29, 1864—March 1865.

When the Association was first formed, Clement Grubb and Ferguson and White, owners of the Robesonia Furnace refused to join the others. However, on September 19, 1866, Clement Grubb joined with the same rights and privileges as the other proprietors.⁶²

The post of **General Superintendent of Mines** was created by the proprietors. The duties of the Superintendent were outlined as follows:

1. to control the Mine hills and Ore banks.
2. mining operations in his care.
3. appointed all assistants and clerks (to be approved by the proprietors.)
4. to fix the wages of employees.
5. record of all mining and sale of ore charge proprietors with ore they have received.
6. all contracts to be in written form only.

J. Taylor Boyd was appointed as the first Superintendent of the ore banks, his salary was set at \$1500 per year. Boyd started his duties as of February 1, 1864.⁶³

Two other items were set forth by the newly formed group. First was the so-called "Clark's Survey" conducted by Jacob Weidle, this was a survey to establish once and for all, the boundaries of the mine hills and ore banks. Until the time of this survey there had been quite some doubt as to the exact limits of the ore banks.⁶⁴ The second issue settled was the amount of ore to be allotted to Robesonia Furnace, owned by Ferguson and White. The quantity permitted for the Furnace was regulated by the average consumption of ore of three to five charcoal furnaces.⁶⁵ The newly formed company bought all the equipment the former owners had in use on the mine hills. The list of equipment bought was quite varied. I believe the following list would be typical for the other owners involved. Prices the Company paid to R. and G. D. Coleman, February 1, 1864 can be found in the testimony of **Coleman vs. Coleman.**⁶⁶

4 mules and harness	550.00
2 dump carts	200.00
354 railroad ties at 50c	182.00
108 railroad ties at \$70 per ton	98.00
1700 w. hammered iron, at \$1.40	119.00
lot of blacksmith and carpenter tools	80.00
6 new picks, at \$2.00	12.00
19 new picks, unfinished \$1.00	19.00
12 Ames Shovels New	13.00
61 cast steel at 26c	15.86
10 wheelbarrows and horse carts	90.00
2000 feet of lumber \$20	40.00
176 bu. of corn in mill \$1	176.00
300 rolled iron at 5c	15.00
265 cast iron at 20c, and 17 churn at 5.10 at \$6.00	78.50
30 crowbars, 750 h at 5c	37.50
10 needles, 25c	2.50
12 iron sledges at \$1.50	18.00
19 cast-steel sledges at \$4.00	76.00
20 striking hammers at \$4.00	80.00
39 wheelbarrows at \$3.00	117.00
11 ramming bars at 50c	5.50
20 steel wedges at 25c	5.00
14 water and powder cans	7.00
89 shovels, 50c	44.50
tamping pick and crow-foot bar	2.25
72 picks, 1.25	90.00
spring wagon \$200 office safe \$30	50.00
powder magazine (stone)	20.00
41.5 tons of iron ore in track \$75 per ton	3112.50
6850 tons of iron ore raised 26c per ton	1781.00
	<hr/>
	7137.11
	180.00
Total should be	7317.11

The above information was derived from actual testimony, but on close examination we can perceive an error. The composer of the report made an error of \$180. We find in the entry—Spring wagon \$200; office

safe \$30 extended as \$50 it should have been \$230. Thus R. and G. D. Coleman were paid \$180 less than they were entitled to receive.

W. Lorenz was named to conduct a survey of the mine hills to report on the possibility of laying a railroad over the hills. Lorenz was also to fix the boundaries of the hills along the estate of R. W. Coleman. The date the Lorenz survey was authorized was March 24, 1864.⁶⁷ On June 3, 1864, Jacob Weidle and A. Grittinger were named by the Association to assist Lorenz in his survey for the future railroad.⁶⁸ The North Lebanon Railroad agreed to lay the track on the two sidings off their main line. The Cornwall Company was to erect all lateral connected to the siding. These lateral lines were laid over the mine hills to facilitate the transporting of the ore to the nearby processors. The date of this agreement to construct the railway was March 15, 1865.⁶⁹ On September 21, 1864, Superintendent Boyd was authorized to employ Lorenz to locate a spiral railroad on the Big Hill.⁷⁰ The Company agreed to pay Lorenz, \$800 for his services up till December 31, 1864.⁷¹ Beginning with April 4, 1865 the Company had an additional contract with James March for the grading of the proposed spiral railway.⁷² The construction of the railway was approved July 13, 1865, by the Ore Banks Company.

The Company must have been pleased with the manner Superintendent Boyd performed his assigned duties, for in its meeting of March 21, 1866, it approved a donation of \$500 to Boyd in addition to his salary of 1865.⁷³ Boyd must have been very capable, for the duties of the Superintendent as outlined by the Company were very comprehensive in their scope and required a man of talent to carry them out fully. The Company was constantly expanding its facilities and in addition to the railway sidings it authorized the building of many houses to be used by the workmen. This can still be seen in the village of Cornwall, as most of the houses seem to be a mirrored image of the one preceding it.

The following is an example of the type report the Superintendent presented to the Company.

Report of the Superintendent

Amount #1 ore shipped to proprietors	45,565.18 tons
Amount #1 ore shipped to E. and G. Brooke	11,052.03 tons
Amount #1 ore sold in market	17,116.02 tons
Amount #2 ore sold in market	28,743.03 tons
Amount #3 ore sold in market	50,439.19 tons

Robesonia shipped	152,197.05 tons
	12,195.18 tons

Total Amount 1868	165,843.03 tons
Copper sold 250 1872/2352 tons	
Report for December 1868 ⁷⁴	

The next phase in the history of the Cornwall Company was that of expanding their total ore bearing area. This was the purchase of the estate of R. W. Coleman, deceased, by the Company. The first step was for the Company to conduct a survey of the Coleman estate. The estate was listed as consisting of the following holdings:

- No. 1
 Containing 20 acres 92 perches, belonging to the heirs of the late Mr. R. W. Coleman, deceased, improved by a dwelling house and stable, the

whole, together with the right to use of the water at the spring near the southeast corner of said tract, for domestic purposes, only valued at one hundred and seventy-five dollars per acre, amounting together to \$3,600.62.

No. 2

Containing 1 acre 80 perches, belonging to Messrs. R and G. D. Coleman, situate within No. 1 and improved by a dwelling now occupied by the Superintendent of the Cornwall Ore Bank Company, and a stable, the whole valued at \$3,000.00.

No. 3

Containing 94 perches, belonging to Messrs. R. and G. D. Coleman, also situated with No. 1, and improved by two frame dwelling houses, one occupied as a boarding house for miners, the whole valued at \$2,700.00.

Agreeable with your request we have also valued the following property belonging to Messrs. R. and G. D. Coleman and G. D. Coleman Esq. for the consideration of the heirs of the late Mr. R. W. Coleman, deceased, with a view to their purchasing the same, viz.

No. 4

Containing 1 acre 20 perches, belonging to Messrs. R. and G. D. Coleman, known as the Dailey Lot, improved by one double dwelling and one log house, the whole valued at \$1,300.00.

No. 5

Containing 3 acres, belonging to Mr. G. D. Coleman known as the Bohenhorn Lot, improved by two double frame dwelling houses, and one old log-house, the whole valued at \$3,000.00.

The total price was \$14,660.00 for the entire Coleman Estate. The purchase was approved by the Company as of September 1, 1865.⁷⁵

The following act taken by the Company in the meeting of September 18, 1867,⁷⁶ seems to me to illustrate an extraordinary amount of foresight on the part of the members of the company. I do not know the exact date of the birth of group insurance plans, but this following statement seems amazing to me. This was a start of a group insurance plan at Cornwall. The Committee approved a plan by which the employees were to pay part of the premium out of their wages, which was to protect the employees financially from injury and accidents. The move is more startling, when we see that there are still some companies after a hundred years, lacking such a group insurance plan. I think that this step certainly adds to the story of the Cornwall Company.

March 20, 1867 was the date of the completion of the Cornwall Railroad. The railroad extended over 16,000 feet (a little over three miles). The lengths of the sidings were as follows:

spiral line on Big Hill	8300 feet
base siding on Big Hill	1000 feet
2nd base siding on Big Hill	1700 feet
3rd base siding on Big Hill	1300 feet
on Grassy Hill	2500 feet
on West Middle Hill	1200 feet ⁷⁷

Thus a great stride forward had been taken with the completion of the Cornwall Railroad. Previous to its construction, the only means of transporting ore was by horse and wagon, a slow and tedious task in the best of conditions.

The company faced still another problem, that of a constant supply of labor. During the summer months the men worked while there was still

enough light to see. Thus the men worked on an average of twelve to fourteen hours per day. Working a week with these long hours would have dampened the ambition of most men. The men preferred to work during the winter months, when the average day was seven to eight hours. In this era of labor relations the men were paid by the day, thus the desire for the shorter days. The Superintendent submitted a plan to remedy the fluctuating situation. He would reduce the summer work day to eleven hours and reduce the wages for the seven hour winter days. This seems to be a logical solution to the problem, but I do not know what resulted from its enactment.

The iron and steel industry of 1870 was similar to the steel industry of today, in that it was a barometer of the trends in business. The Cornwall Company had planned extensive expansion of existing facilities, but in 1873 business suffered a recession. This recession is mirrored in the orders for iron ore. The orders for ore in 1873 declined about 56,000 tons at Cornwall. The Company changed plans for expansion and decided to make only necessary repairs.⁷⁸

Occasionally there were men injured doing their work, who needed immediate medical attention. There was a Dr. Gliem, a physician and surgeon, living on the Cornwall Estate, thus the problem seems solved. But the doctor was having trouble collecting his fees. The miners with large families sometimes ran short of money and the last man to be paid was the doctor. For this reason the doctor was considering moving to another area. If the doctor left, all chance of medical care also was lost. It was for this reason the company took the following step. The company would pay an allowance of \$300 per year in addition to all the fees he could collect.⁷⁹ Thus in the year 1879, the Cornwall had hired a company doctor.

Sometimes the men needed hospital care. The nearest hospital to Cornwall at this time, 1888, was the Saint Joseph Hospital in Lancaster. The Superintendent suggested that the company make a donation for the use of the hospital facilities.⁸⁰ But before action was taken on this suggestion, the Good Samaritan Hospital was built in Lebanon. Because of its nearness to Lebanon the company decided to make an annual contribution of \$300 per year to the Good Samaritan Hospital for the use of a bed.⁸¹

The age of steam and its developments was soon to have its influence on the operations of mining ore. Previous to this time most of the mining was done by pick and shovel, but this was to undergo improvement. On September 20, 1882 the company made arrangements to purchase a steam drill, at a cost of \$1300. The drill was expected to do the work of twelve to fourteen men.⁸² This drill proved to be successful and led to the purchase of another. The second air drill was ordered on March 21, 1883, from the Ingersoll Rock Drill Company. The drill was capable of driving twenty 3½" drills. It was able to mine 400,000 tons of ore per year with only five of its drills operating.⁸³ The prime motive for this machinery was to reduce the cost of the mining and proportionally the cost of the ore.

In the year of 1893 the company took a step which is today a common practice for a business, but was at that time an innovation. The com-

pany decided to investigate the possibility of a telephone connection between Cornwall and the Lebanon exchange.⁸⁴ A committee was to investigate the cost of its construction. It is indeed difficult to conceive of a business operating without the use of a telephone today. This was another step forward in the development of the Cornwall Company.

At this time in its history, Cornwall experienced a new threat to its existence. Up till this period Cornwall had produced the richest ore and the largest quantity, but the era had ended. The growth of the Mesabi Range had begun and was gaining in strength. The new competition had several effects. The Mesabi ore was richer, being about 65 % iron, as compared to about 40 % for Cornwall ore. Transportation had become cheap enough to ship the western ore into the regions supplied by Cornwall. Many of the local furnaces went out of blast, because of the increased competition from the western furnaces. All of these factors led to a general decline in business at Cornwall.

How did Cornwall fight back? It followed several approaches to the problem. First it reduced the price of ore at the mines by .80 per ton, to induce the use of the Cornwall ore.⁸⁵ The second attempt was to study the possibility of concentrating the ore. A car load of ore was sent the Wetherill Paint Co. in Philadelphia to be concentrated by use of electromagnets to a level of 60 % concentration of iron. This process also removed copper worth .10 per pound and sulphur worth \$3.50 per ton.⁸⁶ This is the first use of by-products of the ore produced at Cornwall. Ore was also sent to Dr. Thomas Edison at Orange, New Jersey, who concentrated ore with electro magnets. Edison estimated the cost of selecting the ore by his machinery, including his royalty at not over \$17 per ton and the cost of the machine at \$55,000.⁸⁷ Thus the company fought fire with fire, in offering an ore of higher percentage of iron content, to match its competition.

However, no matter how great the Cornwall Ore Banks Company was to become, and all the other men connected with the Ore Banks, each and every one owed a debt of gratitude to the enterprising Peter Grubb Sr., none of the progress we have seen would have been possible. I believe Peter Grubb most certainly deserves the title of "Father of the Iron Industry" in this locality. Even though all the factors necessary for industry were near at hand, they would have been lost had not the right individual combined them.

We have watched the growth of the Cornwall Ore Mines over a period of about 140 years and its rate of growth has been impressive. Its production rose from a few tons per day till in 1870, according to the report of the Superintendent, the ore banks produced 17,447.17 tons.

While I have tried to be as comprehensive as possible in this paper there is still a wealth of material to be found in the Day-books and ledgers. Most of these reference materials can be found in the Historical Society of Pennsylvania in Philadelphia.

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