

A HISTORY OF MINING IN LANCASTER COUNTY: 1700-1900

Surveying the diversity of mineral resources and mining enterprises in Lancaster County from its beginning, Professor Jack Locher reveals the economic impact from a historical viewpoint.

From the time when William Penn hoped to revive his precarious fortunes through the discovery, processing, and sale of mineral resources from his vast province, the fertile soils of Lancaster County have been periodically scraped up and burrowed into in the search for currently valuable metallic ores. At the beginning the hopes of the prospectors were inspired by visions of silver and gold, influenced, no doubt, by rumors of rich Indian mines in the interior. Iron and copper occupied the attention of the later Colonial and early Federal entrepreneurs. Chromite (chromic iron), nickel, cobalt, and zinc entered into the mining picture in the latter part of the period under discussion. Of these, only iron, chromite, and nickel were the foundation of any extensive and successful operations. The others were mainly hopes, the histories of which, to varying extents, have faded with their prospects.

For the purpose of this study the area to be included is that of present day Lancaster County, estimating from the none-too-exact early references which places included in the Chester County of early Pennsylvania fall within this limit. Conversely, one must eliminate those portions of the original Lancaster County which subsequently fell within the bounds of later formed counties.

Quite naturally, usually the availability of reliable records of mining operations varies markedly, usually in direct proportion to the length of time between the day of the operation under investigation and the present. In the existing accounts of mining in the earlier part of the two centuries, one has to discard much as being based on no more than hearsay, although the repetition by several apparently unrelated sources of such information would seem to be proof of existence of the mine despite the fact that no detailed record of its operation can be discovered.

From the beginning of colonization in his province William Penn evinced an interest in mineral possibilities, stemming probably from his connection with the iron industry in England, and this interest grew into a fond hope for rescue from his pressing debts in the lean years when he found himself putting much more into his province than he was taking out of it. As early as July of 1683 we find him writing to Lord Keeper North of the existence of "mineral of iron and copper in various places."¹

In 1709 Lancaster County areas entered into Penn's dream of mineral wealth when the proprietor learned from one, Mitchel, that ex-Governor Evans was profiting hugely from silver mining operations back of Conestoga, the Indian village seven miles southwest of the future site of the city of Lancaster. On March 9 of that year he wrote from Reading, England, to James Logan, Secretary of the Province and Clerk, as well as voting member, of the Provincial Council:

I learn the misunderstanding between the late Governor and thyself, if they say true, has cost me dear; for they assure me he and company may; and they believe do, make £100, if not twice told, weekly. The Indians chiefly discovered the mine and work it on the spot, and he told me the way of it. It is the king of the Shawnoe Indians, and some few of his subjects that perform the business for him, viz., Colonel Evans. Pray scrutinize the matter well, and let me hear from thee with all the speed thou canst; for the assurances Mitchel gives me, makes me solicitous to pry into the affair, whence help and reward may arise to deliver me.²

In June following Logan wrote in reply that Evans denied ever making or possessing any such amounts of money, and concludes that the "story of his getting by the mines I believe to be a very fiction."

Whether Evans had any connection with the mines or not, it seems probable that the rumor had factual basis in the silver mine in what is now Pequea Township of Lancaster County. This mine, which answers to the description "back of Conestoga," was worked by the Indians about this time. The latter were undoubtedly more interested in the lead which bore the silver (one ton of lead containing two hundred and fifty ounces of silver) than in the precious metal. A moulded lead bullet taken from an Indian grave at Washington Boro, Lancaster County, estimated to date from around 1700, assays precisely as argentiferous as the Pequea ores, a combination not found elsewhere in Eastern North America.³ Whether the Indians realized that the silver intermixed with the lead had value is problematical, but it seems certain that some of the white men were attracted by the prospect of a rich silver mine. The Colonial Records of the period make mention of the fact that Marylanders and Indians were coming north to prospect in Penn's domain, this being one of the sore points

in the border troubles of that time. And tales of this mine may have been the basis for the inclusion by Christopher Sowers in his "Description of Pennsylvania" of 1724 of precious metals among those found in Pennsylvania.⁴ Apparently the difficulty in extracting the ore from the hard milky quartz in which it is imbedded must have discouraged eventually all attempts to make a success of the mine, and the shaft has been abandoned beyond record, although it still offers chunks of the ore to the knowing explorer who braves its damp recesses.

The third decade of the Eighteenth Century seems to have been a particularly active one as far as mining hopes in the Lancaster County area are concerned. In 1721 John Cartlidge of Conestoga wrote to a friend, Isaac Taylor: "There is come into this province from New England a gentleman named John McNeal, and he hath been with me and we have viewed the iron oar and matter yt we have laid out."⁵ Whatever schemes Cartlidge and his friends may have been projecting, of their fruition or their failure there is no record, but it is likely that the "iron oar" surveyed by these worthies was one of the banks which will be discussed later in this history.

On April 25, 1722 in Philadelphia a bond for five thousand pounds was signed by Edward Pleadwell guaranteeing that one sixth of mines and minerals discovered by Pleadwell and his associates would be made over to James Logan. The latter was to pay one sixth of the cost of purchasing the mines and of processing the ore, seemingly an early example of "grub staking." The site of the prospecting in question — which seems to have been underway before the time of the document, since it clearly states that Logan is to have his share of everything "heretofore" discovered as well as what was subsequently found—was the "Octoraroe" Creek, which as the Octoraro today marks twenty miles or more of the boundary between Lancaster and Chester Counties immediately above the Maryland border.⁶

One reads that in the same year of 1722 there were deposits of copper found in Lancaster County⁷ but there is no supporting evidence. It is probable that this was the copper mine in Bart Township which is known to have been worked later in the century and which will be discussed later in this paper as the famous Gap Copper, later Nickel, Mine.

These shadowy enterprises lead us to the mineral which later in the century began its rise to a place of eminence among Lancaster County products and the history of which is the backbone of this study. That mineral is iron ore.

II

European travelers in the early days in Pennsylvania were astonished by the prevalence of easily obtained iron ore. Until the middle of the Eighteenth Century these reports were, as far as Pennsylvania was concerned, usually confined to the area of the counties surrounding Philadelphia, although one history does report that iron ore was known to exist in 1732 in what was later to become Lancaster County's West Hempfield Township. This history also reports mining having been underway near Marietta by 1769 and at the Molar Bank Mine in Providence Township which supplied a pre-Revolution furnace in central county.⁸

Samuel Gustav Hermelin was one of the travelers in 1783 and one who left a detailed and trustworthy account.⁹ He came from Sweden and was traveling in the interest of his government, inspecting the various phases of iron manufacture in the new Federation, and probably estimating what effect it would have on the flourishing Swedish iron industry. He claims to list all the iron mines in Pennsylvania of that year and among them are two in Lancaster County: the mine supplying Elizabeth Furnace and one at Martic Forge. The first he describes as a stratum mine and the second as consisting of stratum ore in lumps in a bed of clay.

A German traveler of the same year has left an informative account of the mining operation in the general area under consideration. Johann David Schoepf traveled extensively in the new nation in 1783 and 1784, spending much time investigating mining operations. Referring to the Warwick Mine-Holes (barely over the Lancaster County border in Chester County), Schoepf says:

The iron ore lies here, (as very generally in America), heaped up in hills and shallow beneath the surface-mould. The surface of these hills is an iron-bearing sand; next, there lies a brown ochre-earth with little iron-stones intermixed, beneath which is a bed, of no great depth, of course, red-brown ore, commonly soft; farther down, a whiteish clayey stratum, still somewhat mixed with iron-bearing earth. The greatest depth they have reached is 20 feet, a sufficient store having been found above. Any knowledge of mining is superfluous here, where there is neither shaft nor gallery to be driven, all work being done at the surface or in great, wide trenches or pits.¹⁰

Immediately thereafter, speaking of Jones's Mine-Holes (again barely outside our area, this time near Morgantown in Berks County), Schoepf says: "The work is carried on as mentioned above. That is to say, they dig here or there deep and wide, open pits, and when these grow inconvenient on account of depth, water, or other circumstances, they begin new ones."

This would seem to be the pattern for mining operations in the county at that period although the Lancaster operations were probably not so extensive as these. Since the two mines mentioned by Hermelin were both in connection with individual enterprises, Elizabeth Furnace and Martic Forge, there was probably need for no more than three or four men to dig all the ore needed in each case.

There is evidence of a mining operation in Lancaster County during this period which escaped the notice of Hermelin. An investigator in 1842 who had access to the books of Elizabeth Furnace estimated that between fifty and one hundred loads of ore were mined in the years 1782 to 1785 at "Chickey's" (which will be referred to later as the Chestnut Hill Ore Banks) on land owned by David Forrey and James Smith. This ore was sold to Elizabeth Furnace and thus was made note of in the Furnace's cash books.¹¹ The operation seems to have been an irregular one, probably carried on by Forrey himself in time not spent in farming his acres on Chestnut Hill. A Nineteenth Century history of the county confirms this in stating that the Chestnut Hill ores were worked to a limited extent in the previous century.¹²

The mine at Elizabeth Furnace mentioned above was operated before the Revolution and at least as early as 1768, for in April of that year when the fabulous "Baron" Stiegel purchased the property the amount of the transaction is scrupulously recorded in the Furnace account book. The "Minehole" was valued at thirty pounds, eight shillings, a figure difficult to translate into money of today, but about which we gain some realization when we juxtapose it to the concurrent valuation of the house at eighty-one pounds and the "Plantations" at one hundred and six pounds.¹³

The years between the Confederation and the Civil War yield few records of Lancaster County iron mining. Systematic operation of the Chestnut Hill mines, the only deposit of any great importance in the county and the only one to be discussed in any detail in this paper, began in 1820 and continued for sixty years. The Ely mines about two miles south of Strasburg were opened in the early 1800's and worked for twenty years before being abandoned. Under Civil War pressure they were reopened in 1862 and were given up finally in 1870. One also finds mention of an unnamed mine in Pequea Township which began operation in 1816 and carried on until 1882.¹⁵

It seems obvious that there must have been several other iron mining operations in the county during the early part of the century, since the number of furnaces in the Lancaster area grew from seventeen in 1786 to over a hundred by the 1830's, ranking at that time among the leading iron producers of the nation.¹⁶ Unfortunately, records for this period are scarce and it is not until 1860 that one can give anything like a full picture of Lancaster iron mining. In that latter year the county entered into its two great iron mining decades, years in which the industry blossomed under the demands of the Civil War and post-war expansion, to be blighted ultimately by the flood of Lake Superior ore to the rising steel capitals of the West.

Boyd's Lancaster County Business Directory 1859-60, published in Lancaster in the latter year, lists ten iron ore mines in the county. Two of these are at Marietta: John Clark's on Maytown Road and Schultz's on the Mt. Joy Pike. The other eight (Bohrer and Bruehart; Chestnut Hill Iron Ore Company; H. Copenheff; C. B. Grubb; E. Haldeman and Company; Hoagendahl; John Shirk; and Smith and Hoagendahl) are listed as being at Silver Spring, the post office for all the various operations in the extensive Chestnut Hill Banks. This directory contains no listing of the Pequea Township mine mentioned above as having been in operation from 1816 to 1882, but since the directory was a subscription enterprise, it does not prove that the Pequea mine was not in operation at the time.

The national census reports for that year, 1860, the first in which they are of any value to this investigation, list only seven iron mines in the county. It is quite probable that some of the complex operations at Chestnut Hill are consolidated in the census report. The seven mines were capitalized at \$201,200, they employed 281 men to whom was paid \$59,040 in yearly wages, and they produced ore worth \$121,000.

The census reports for 1870 show the tremendous rise of iron mining brought on by the Civil War and continued by the industrial expansion

of the nation after the war. There are listed for that year seventeen iron mines in the county with a capitalization of \$638,000. Eight hundred and sixty-four were employed and their wages came to \$321,871. The production was 145,321 tons of ore (this information had not been included in the previous report), the value of which was \$545,501. From 1860 to 1870 it may be seen that the number of mines more than doubled, their capitalization trebled, the working force quadrupled, and the value of the product in the latter year was not quite four and a half times its worth in the former. The average annual wage of the miners offers another interesting contrast (although the validity of the average figure is questionable), it having grown from \$210 annually in 1860 to \$372.50 in 1870.

A historian, Mombert, writing in 1869, offers some figures which differ somewhat from those of the national census, although the disparity may be accounted for in the fact that there was at least a year separating the times of the taking of the respective statistics. Mombert estimated that the thirteen furnaces operating in the county in that day used 180,000 tons of ore, of which only 50,000 were mined in the county. The balance came from the counties of York and Lebanon (Cornwall), with a little from Perry and Cumberland Counties. In turn Lancaster exported 30,000 tons of ore to Phoenixville, Danville, and other furnace centers, thus setting county production at 80,000 tons annually. Assuming Mombert's estimated value of four dollars per ton (the average for the census figures comes to \$3.75 per ton), this production represented \$320,000 worth of ore yearly.¹⁷

A question about the price paid for ore is raised by the figures put forth by an investigator doing research in the field of the ironmasters of Marietta and vicinity.¹⁸ The ledgers for the Musselman Furnaces at Marietta for the years 1868-74 list prices per ton for ore ranging from fifty cents to \$1.25, a sharp difference from the figures listed above. However, since this ore was taken from banks on the Musselman farms and adjoining ones, it seems likely that this figure covers only the digging and hauling of the ore on some kind of a contract arrangement with local labor, the rights to the mineral being paid for where necessary in some other fashion. Assuming this, we can arrive at a rough figure of twenty-five per cent as being that portion of the price of the ore at the furnace which would cover the expenses involved in mining and hauling. The tenth national census clearly shows the decline of mining in Lancaster County. In 1880 there were eighteen active mines in the county (one more than was listed ten years before), but the production had fallen off to 78,850 tons, hardly more than half the 1870 figure. The production tonnage is the only figure given in this report, although this figure is then broken down into individual amounts for the mines listed. Among the chief producers and their totals were the following: Grubb Mine at Silver Spring, 14,434 tons; Chestnut Hill Mine, 13,440 tons; mine of Mowrer, Reese, Brooks, Herr, and Heller in Providence Township, 9,023 tons; Monocacy Furnace Company mine in Providence Township, 7,840 tons; Silver Spring-Chestnut Hill Mine, 7,799 tons; and the Beartown Mine at Beartown, 6,818 tons. The remaining tonnage is scattered in small amounts among twelve mines,¹⁹ most of

which are merely named and not located. It can be seen, however, that many sections of the county are represented, although the Chestnut Hill and Silver Spring area contained several of the mines and furnished the bulk of the tonnage.

In the year of 1880 there also appeared, in connection with the Second Geological Survey of Pennsylvania, a volume by Persifer Frazer on the geology of Lancaster County. In this publication is a list of all known mining operations in the county, active and defunct. The list contains the impressive total of forty-two mines.²⁰ Many of the mines named on the report of the 1880 census cannot be found on this list, but, since the mines most often changed names as they changed operators, it may be surmised that Frazer has listed the questionable mines under an earlier name. From the apparent thoroughness of the Geological Survey, one sees no reason to question the validity of Frazer's listing as a total of iron mining operations of the county during the most active decades, although the problem of names and locations lessens its value for research.

The report of the 1890 United States Census, *Mineral Industries*, tells the end of the story of Lancaster County iron mining. In that year there were reported operating in the county no iron mines. Pennsylvania, which heretofore had always headed the list of ore producing states, now fell to third behind Minnesota and Alabama. The halcyon days of Lancaster County and Pennsylvania iron mining were over.

To ascribe the falling off of iron mining in Lancaster County to a playing out of the ore would be to ignore the changing picture of the iron industry in the United States. Although Lancaster County contains all four kinds of commercially important iron ore, magnetite (Fe_3O_4), red hematite (Fe_2O_3), brown hematite or limonite ($\text{Fe}_2\text{O}_3 \times \text{H}_2\text{O}$), and carbonate ($\text{FeO} \cdot \text{CO}_2$), only limonite and magnetite existed in quantities great enough to warrant exploitation. Of the two, limonite was by far the more important, all the mines listed in the 1880 census report being of that type, and most of it was a fairly low grade. It could not compete with the richer Great Lakes ores when they began to come on the market in quantity.

With the opening in 1854 of the Sault Ste. Marie Ship Canal, which links Lake Superior to the other lakes and the East, the ores of Michigan's Marquette Range first came to the market. These ores contained better than sixty percent pure iron plus oxide of manganese which made it ideal for the manufacture of the very highest grade steel. The yearly increasing output of this range, however, was swallowed by the war needs and subsequent industrial expansion without immediate effect on the older mines. In 1884 the Vermillion Range of Minnesota began producing ore and by 1889 it was putting on the market nearly a million tons of ore yearly. In 1891 the untold resources of the Mesabi Range of Minnesota were first tapped for the market. It is no wonder that the small enterprisers in Lancaster County saw no profit in continuing to extract their inferior ores.

In this time there was one dying gasp of the Lancaster mining industry. In 1881 the Pequea Iron Company was organized for an attempt to exploit the magnetite ore which was found to extend for half a mile on either side of the Pequea Creek in Martic and Conestoga Townships about

a mile northwest of Marticville. It was hoped to make this ore, which was more valuable than the limonite (it is magnetite ore that keeps the Cornwall Mine in Lebanon County operating to this day when all other mines in Pennsylvania have long since shut down), commercially available by magnetic concentration and briquetting. To this end the most advanced machinery and much effort were expended, but the industry dragged along for some years and then failed, a victim of its own expensive processes and of the Western competition.²¹

Having surveyed the high spots of Lancaster's iron mining, it would seem well before going on to other metals to recount what details are known of the principal iron mining enterprise, that centering on Chestnut Hill. As was mentioned earlier, this ore bank was known to have been worked lightly just after the Revolution. In 1820 methodical and more or less continuous operations were begun by E. B. Grubb on the northeast end of the banks, which stretch on a northeast-southwest line. A county historian writing in 1869 estimated that from 1832 until the time of his calculation there had been one million tons of ore taken from these banks.²² Another authority puts the period of greatest production in the years between 1863 and 1880,²³ so one can safely say that this bank in its active lifetime produced several million tons of ore. In the later years this ore principally supplied the St. Charles, the Henry Clay, the E. Haldeman Company, and The Chickies Iron Company furnaces, all three miles north of Columbia at Ironville.

In 1877 the main ore bank at Chestnut Hill was divided three ways: the northeast portion went to the heirs of E. B. Grubb, the center to C. B. Grubb, and the southwest part to the Chestnut Hill Iron Company. Three years later the mining was abandoned and has never been taken up. The diggings on the northeast subsequently flooded, the water covering an area of several acres, which is now known as Grubb Lake.

In addition to the main bank at Chestnut Hill, there were several smaller related mines. The Silver Spring Mines, bordering the above on the north, was operated by E. B. Grubb in conjunction with two partners from 1863 to 1874. The Heiss Mine was a small pit south of the main bank. Some distance away, on the south bank of Chickies Creek was the Copenhoffer ore bank, and an eighth of a mile further south was Sherk's (Shirk's?) bank, which for a period of ten years produced 1,000 tons annually. Adjoining the Sherk mine was the small pit of R. Garber. These comprised the Chestnut Hill-Silver Spring operation and all may be found in Frazer's listing of 1880.

III

There remain to be discussed three Lancaster County mining enterprises which were of considerable economic importance, two of them attaining a measure of national renown, while the third seems to have been as much a speculation as a going industry. The latter was the Bamfordville zinc mine, and the two former were the Gap copper-nickel mine and a group of closely related chromite mines in Fulton and Little Britain Townships.

The Gap enterprise was the earliest mining operation recorded for Lancaster County as it is now constituted. One investigator places the beginnings of the mine in the year 1718.²⁴ Deeds have been cited as revealing that the land was known to contain minerals as early as 1720-22, and there are records of the Gap Mining Company having been ordered to be surveyed in 1763.²⁵ A history of mining published in 1854²⁶ dates the opening of the mine for copper in 1732, with a renewal of the enterprise in 1797, indicating that the mine was probably never worked very profitably and was often let lapse into desuetude. A prospectus issued in the latter year for the renewal of the enterprise bore the following on its title page:

A plan with Proposals for forming a Company to work mines in the United States, and to Smelt and Refine the ores, whether of Copper, Lead, Tin, Silver or Gold, by Benjamin Henfrey. The original can be seen at the Philadelphia Library, No. 91,025. Printed by Snowden and McCorkle, No. 47 North Fourth Street, Philadelphia, 1797.²⁷

This ambitious undertaking seems not to have come to much, although the mine must have been worked very shortly thereafter. In 1809 a traveler from Philadelphia, Joshua Gilpin, in his account of his travels wrote upon arriving at Lancaster, "A few miles to the left of where we passed the 35 M stone today there has been a copper mine lately worked — the same ridge of hills is said to abound in copper throu the U. States—but the ore is not rich."²⁸

The fortunes of the Gap mine took a turn for the better in the 1850's when it was discovered that in the waste products of the copper mining process there was nickel ore in such quantities as to make it commercially more important than the copper. A prospectus of the Gap Mining Company, including its act of incorporation approved by the state legislature on April 8, 1951, contains a letter from Professor Fred A. Genth, a geologist of the University of Pennsylvania, to the Board of Directors. It is dated May 29, 1851. Genth described the shaft of the old workings as being about sixty-five feet deep and seven feet on a side. He distinguished three types of ore: nickel, copper, and mixed. He suggested that at a greater depth the nickel might disappear and the copper vein become stronger. However, he based his good opinion of the prospects of the undertaking in part upon the presence of the rich nickel ore.²⁹

By 1858 the mine was producing nickel in quantity and as its principal product, although *Boyd's Lancaster County Business Directory* for 1859-60 lists the Gap Mining Company under "copper mines." The report of the Eighth Census, *Manufacturers of the United States in 1860*, lists the mine as producing \$30,626 worth of nickel ore. The company was capitalized at \$90,000, and it paid \$18,000 in wages to forty employees. Ten years later the census reports a drop in all categories: product, \$24,000; capitalization, \$60,000; and wages, \$6,400 to forty-eight workers. The census figures for 1880 show a sharp upturn. The product was worth \$149,890 (from 299,780 pounds of nickel ore); the capitalization was \$325,000; and \$19,000 was paid to sixty employees. In addition the mine produced 10,337 pounds of cobalt valued at \$5,169 and 135,720 pounds of copper.

Since the 1880 census report was the first to give tonnage of ore produced, for earlier figures we must depend upon the estimate of Joseph Wharton, the Philadelphia entrepreneur who obtained control of the Gap Mining Company in 1863. He estimates the production for the years 1858 to 1860 as being thirty-eight million pounds. In 1863 under his direction the yearly output was four and a half million pounds, and the yearly average from 1864 to 1874 was 9,200,000 pounds.³⁰ The discrepancies between these figures and the census figures can perhaps be explained if we realize that the census years were not years of maximum demand. The seemingly good year (in the census report) of 1880 was actually one of cut-back, for the mine had begun to slow down in 1877.

A mining book published in 1888 says that, "In the United States the ores of copper-nickel found at Gap Mine, Lancaster County, Penn., are the chief and only ores, of any consequence, produced. . . ."³¹ At about this time nickel ore from Canada was coming on the market in quantity and at a low price, since the Canadian mining offered no such expensive handicaps as deep shafts and the constant pumping of water. Thus it is that the 1890 census report finds nothing of consequence to report on nickel production in Lancaster County, and offers, by way of explanation, the story of the Canadian nickel mines. The official cessation of operations of the Gap mine was in 1893, and thus nickel and copper joined iron in the limbo of bypassed industries in Lancaster County. Today only the grown-over workings and the informal place name, Nickel Mines, remain to mark nearly two centuries of mining hopes and efforts.

Another ore, the production of which was virtually a Lancaster County monopoly for a number of years, is chromite or chromic iron (FeCr_2O_4). There were a number of valuable deposits of this mineral in the serpentine of Fulton and Little Britain Townships. The industry was founded by Isaac Tyson of Baltimore, who had exhausted his supply of chromite in the Bare Hills near the Maryland city and had come north prospecting for new sources. He found these rich deposits in Lancaster County, and he and his heirs profited from his discovery, since these mines were at one time the world's largest producer of chromite, as well as being the only mines under production in the United States. The mining began in Wood's Mine in Little Britain Township, by far the most important of the several mines in the area, in 1827 and continued until 1882, with a gap from 1868 to 1875.

In addition to that from Wood's Mine, chromite was taken from the following mines, all running more or less in a line in the hills of southern Lancaster County: Line Pit Mine, Lowe's Mine, Red Pit, Little Horseshoe Mine, Carter's Mine, Jenkin's Mine, Reynold's Mine, and Rock Springs Mine. Professor Genth, whose name appears frequently in the geological annals of Lancaster County, in the years when the industry had about run its course, estimated the production of these mines as follows.³²

Wood's Mine	120,000 tons ³³
Rock Spring Mine	1,000 tons
Lowe's Mine	700 tons
Carter's Mine	400 tons
Little Horseshoe Mine	30 tons

In addition, Genth mentions Red Pit as being considered next to Wood's Mine in importance, but he gives no production figures. Wood's Mine was worked to a depth of 700 feet, but most of the others were not much over 200 feet in depth, if that deep.

The 1880 census report is the first to mention the production of chromic iron. It lists one mine (obviously Wood's), capitalized at \$21,000, employing twelve hands who were paid \$4,860, and which produced three hundred tons of ore worth \$9,000. Ten years later the enterprise had been given up, and the 1890 census report, "Mineral Industries," under chromic iron gives only the history of Tyson's enterprise. In this case it was California and Siberia which produced the better and cheaper ore, and the Lancaster County chromite mines, although they were certainly not exhausted, went the way of iron, copper, and nickel.

There remains one mining enterprise to discuss and it is much more loosely defined than any of the others. It is the Bamfordville zinc mine. This seems never to have been a profitable undertaking, and has sometimes been called a wildcat stock sales project rather than a serious mining enterprise.³⁴ In view of the fact that the principal source of information on this mine is a prospectus put out by the Lancaster Zinc Company in 1855, it would seem open to question whether to include the Bamfordville mine in a study such as this. However, the company's statement includes a report by the ubiquitous Professor Genth, whose knowledge cannot, and whose honesty will not, be questioned to the end of making this history as full as possible. Thus, on the testimony of Genth the Bamfordville Zinc Mine takes its place as the final enterprise to be discussed.

Genth's report, dated August 14, 1854, places the mine about five miles northeast (northwest?) of Lancaster on the main line of the Pennsylvania Railroad. The company's lands included a little over one hundred acres. He states that the property had been worked earlier for galena, as evidence of which there remained a thirty foot shaft, but the project had failed for lack of profit. However, the zinc was discovered and found to be valuable when oxide of zinc began to be used in paints. At the time of his report, Genth stated that there were on hand 180 tons of mined ores, in addition to others mixed with dolomites.³⁵

The general agent and treasurer reported that ten of a projected twenty furnaces were already erected (a statement that seems open to doubt in view of the fact that ruins of no such number of furnaces have ever been found), and that there had been a suspension of building because of bad business conditions during the winter of 1854-55. The treasurer's report shows that 74,600 shares of stock worth \$186,500 had been issued in payment for lands and mining rights, plus \$8,750 in cash for real estate. Erection of works was reported to have cost \$23,776.17 to the date of the report, May 1, 1855.

It seems obvious that the project — call it stock sales scheme or merely ill-planned and unprofitable venture — did not last long. Accepting Genth's report in good faith, we will add the Bamfordville Zinc Mine to the annals of Lancaster County mining, it being the shortest and most shadowy enterprise of any on the list.

Thus the list of Lancaster County mining ventures in the period 1700 to 1900 is exhausted. The tale generally is one of marginal operations, flourishing for their brief day under the stimulus of war or industrial expansion, and fading as cheaper or more copious supplies were found elsewhere. The mining of iron was the only one of these various ventures which was of any general economic significance in the county, for, although the chromite and nickel mines of Lancaster County were each in its day a national monopoly, these were not really extensive operations. On the other hand iron was mined widely and over a long period of time, although even this mining pales into economic insignificance beside the furnaces and forges of Lancaster County, which in their boom days had to go beyond the borders of the county for their supplies of ore.

As a conclusion to this brief history, it seems appropriate to remark that the present day steel industry, spurred by an ever-increasing demand for its product and armed with new methods for making use of low grade ores, is showing some interest in the long-deserted iron lands of Lancaster and surrounding counties.

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NOTES

1. F. A. Godcharles, **Pennsylvania: Political, Governmental, Military and Civil** (New York, 1933)
2. **Penn-Logan Correspondence**, Vol. II, p. 321.
3. Much of this information is from a letter of Dr. Herbert H. Beck to the writer of this paper. Dr. Beck, whose 1912 monograph, "The Minerals of Lancaster County," is still standard and was used as a guide in this paper, based his conclusions on his own assays and his extensive knowledge of Lancaster County history.
4. R. W. Kelsey, "An Early Description of Pennsylvania," **The Penn-Magazine of History and Biography**, VI, p. 250. Sowers apparently mixed fact and wild rumor in the letter he wrote to his kin in Germany on December 1, 1724. Since Sowers moved to Ephrata (Lancaster County) in the following year, it is possible that he could already have made a journey to that place and have seen enroute the ore-rich sections of Chester and Berks Counties. Much of his talk of minerals, however, smacks of high pressure salesmanship: "Many a man has bought a property for 100 florins and found 1000 florins in gold, silver, copper ore . . . Iron stone occurs in such great quantities that it lies often for a space of some miles only knee deep in the ground, and is rich in iron. They say 100 pounds of stone contains 70-80 pounds of iron."

5. H. Frank Eshleman, "The Birth of Lancaster County," **Lancaster County Historical Society Papers**, XII (1908), p. 20. See also Rupp's *History of Lancaster County*, p. 260.
6. From the original document in the collection of the **Pennsylvania Historical Society**.
7. **Colonial Records**, III, (Philadelphia, 1852), p. 160.
8. Ellis and Evans, **History of Lancaster County** (Philadelphia, 1852).
9. Samuel Gustaf Hermelin, **Report About the Mines in the United States of America, 1783**, trans. Amandus Johnson (Philadelphia 1931).
10. Johann David Schoepf, **Travels in the Confederation (1783-1784)**, trans. Alfred J. Morrison (Philadelphia, 1911), p. 7.
11. From a letter written by S. Guilford to W. M. Meredith (September 5, 1842) in the collection of the **Pennsylvania Historical Society**.
12. J. I. Mombert, **An Authentic History of Lancaster County** (Lancaster, 1869), p. 492.
13. From "Elizabeth Furnace Account Book" in the collection of the **Pennsylvania Historical Society**.
14. Jacob Hildebrand, "Reminiscences of Strasburg," **Lancaster County Historical Society Papers**, I, (1897), p. 94.
15. Ellis and Evans, p. 1011.
16. Raymond E. Murphy, **The Mineral Industries of Pennsylvania**, (Harrisburg, 1933).
17. Mombert, pp. 492-3.
18. Bertha S. Gramm, "The Ironmasters of Marietta and Vicinity," **Lancaster County Historical Society Papers**, LII (1948), pp. 137ff.
19. The remaining mines and their tonnage are as follows:

Reading Iron Works	3,835 tons
Donegal Furnace	3,316 tons
Jos. C. Wright	3,295 tons
Conestoga Mine (Conestoga Twsp)	2,500 tons
Prescott Mine	2,161 tons
Vesta Furnace	1,736 tons
Rakestraw Mine	1,411 tons
Charles Geiger Mine	773 tons
J. Hildebrand Mine	310 tons
Col. Jos. D. Potts Mine	120 tons
H. H. Lefevre Mine	29 tons
Charles Mine	9 tons
20. These are the mines listed by Frazer (p. 206):

Chestnut Hill Ore Banks	B. B. Myers' Bank
Sherk Ore Mine	Stewart Smith's Ore Bank
Coppenheffer's Bank	Daniel Lefever's Bank
R. Garber's Mine	Cabeen and Co. Bank
J. Hertzler's Mine	B. J. Meyer's Bank
Chestnut Hill Mines	Peacock and Thomas' Bank
Heiss's Mine	Brooks Bank
Silver Springs Mines	Eckert and Co. of Reading
C. B. Grubb's Ore Banks	Eckert and Hensell Bank
Good's Iron Ore Bank	Amos R. Herr's Ore Bank
Reeve's Bank	Mylin Ore Bank
M. R. Shenk Bank	Shirk's Ore Bank
Cooper Ore Bank No. 1	McKay's Bank
Duffy's No. 1	Shirley's Bank
Duffy's No. 2	Garman's Bank
Peacock's Mine	Levi Smith and Sons Bank
Geo. Mowrer's Mine	Beartown No. 1
Eshleman and Patterson's Mine	Beartown No. 2
Eshleman and Patterson's Pit No. 2	Sensinning Ore Bank
Geiger's Ore Bank	Russel's Mine
Cook, Wright and Co. Mine	Garman's Mine

21. John W. Price, Sr., "A History of the Magnetite Mines in Conestoga and Martic Townships," *Lancaster County Historical Society Papers*, LVII, No. 2 (1953).
22. Mombert, p. 492.
23. Anna I. Jonas and George W. Stone, *Topographic and Geologic Atlas Of Pennsylvania, Number 168, Lancaster Quadrangle*, (Harrisburg, 1930).
24. H. L. Willig, "Two Notable Mining Industries in Lancaster County," *Papers of the Lancaster County Historical Society*, XXVIII (1924), p. 73.
25. R. J. Houston, "The Gap Copper Mines," *Lancaster County Historical Society Papers*, I (1897), p. 283.
26. J. D. Whitney, *The Metallic Wealth of the United States*, (Philadelphia, 1854), p. 317.
27. Houston, "The Gap Copper Mines."
28. Joshua Gilpin, "Journal of a Tour from Philadelphia Thro the Western Counties of Pennsylvania in the Months of September and October, 1809." *The Pennsylvania Magazine of History and Biography*, L (1926), p. 74.
29. "The Act of Incorporation and By-Laws of the Gap Mining Company of Lancaster, Pa." (Philadelphia, 1851). The copy of the document used for this paper is in the library of the Franklin Institute.
30. Willig, "Two Notable Mining Industries."
31. H. S. Osborn, *A Practical Manual of Minerals, Mines, and Mining*, (Philadelphia, 1888), p. 135.
32. Willig, "Two Notable Mining Industries."
33. Beck in his "Minerals of Lancaster County" estimates the production from Wood's Mine by 1875 to have been 25,000 tons.
34. In a letter to the writer of this paper, Dr. Back says that in 1896 he was told by a Lancaster chemist that the Bamfordville mine was "salted" with galenite brought from elsewhere to promote the sale of stock.
35. "Statement of the Condition and Prospects of the Lancaster Zinc Company, through the Reports of the General Agent and Treasurer," (Philadelphia, 1855). In the Franklin Institute Library.

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