1. NAME OF PROPERTY

Historic Name: Lightfoot Mill

Other Name/Site Number: Collins Mill; The Mill at Anselma

2. LOCATION

Street & Number: 1703 Conestoga Road Not for publication:__

City/Town: Chester Springs Vicinity:__

State: PA County: Chester Code: 029 Zip Code: 19425

3. CLASSIFICATION

Ownership of Property		Category of Property	
Private:	x	Building(s):	x
Public-Local:	___	District:	___
Public-State:	___	Site:	___
Public-Federal:	__	Structure:	___
		Object:	___

Number of Resources within Property

Contributing	Noncontributing
1	1 buildings
___	___ sites
___	4 structures
___	___ objects
1	5 Total

Number of Contributing Resources Previously Listed in the National Register: 1

Name of Related Multiple Property Listing: n/a

4. STATE/FEDERAL AGENCY CERTIFICATION

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this ____ nomination ____ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ____ meets ____ does not meet the National Register Criteria.

Signature of Certifying Official Date

State or Federal Agency and Bureau

In my opinion, the property ____ meets ____ does not meet the National Register criteria.

Signature of Commenting or Other Official Date

State or Federal Agency and Bureau

5. NATIONAL PARK SERVICE CERTIFICATION

I hereby certify that this property is:

___ Entered in the National Register
___ Determined eligible for the National Register
___ Determined not eligible for the National Register
___ Removed from the National Register
___ Other (explain): _____

Signature of Keeper Date of Action

6. FUNCTION OR USE

Historic: Industry/processing/extraction Sub: manufacturing facility

Current: Recreation/culture Sub: museum

7. DESCRIPTION

Architectural Classification: Other: Mill

Materials: stone construction

Foundation: stone
Walls: stone
Roof: wood: shingle
Other:

Describe Present and Historic Physical Appearance.

Overview

Constructed circa 1749, the Lightfoot Mill is a two-and-one-half story, stone, gabled roof structure located along the Pickering Creek, in West Pikeland Township, Chester County, Pennsylvania. Built as a custom grain mill, the mill has a high degree of historic integrity in both the mill building and the extant milling machinery.

Contributing Resources
1 Building Mill

Non Contributing Resources
1 Building Simmers'/Collins' House (labeled Night Miller's House on map)
4 Structures springhouse
wagon barn
head race
tail race

Site

The mill is accessed from PA Route 401 along a gravel driveway (Figures 1-3). The driveway approaches the mill from the northeast and meets the mill at its east corner. The driveway ends in an open parking area. South of the mill is a two-and-one-half story stuccoed stone dwelling (Simmers'/Collins' house labeled as the "night miller's house"on the site plan) which was built during the 1870s (Figure 14). Located southeast of the approach driveway is a short section of driveway that begins at the northeastern corner of the parking area and meets the approaching driveway to form a loop.

Within the area inside the loop of the driveway sits a small springhouse, which may date to the 18th century. The springhouse is constructed of stone with whitewashed walls and has a gabled, wood frame roof covered with wood shingles.

Directly to the north across the driveway from the springhouse is a wagon barn, build during the late 19th century. The barn is a two-and-one-half story vertical board sided structure that has a one story shed section running its depth on the east side. The barn has been adapted to serve as a visitor center for the mill.

The site map includes two structures that have been moved in recent years. To the east of the barn was a one-story chicken coop with a shed roof and vertical board siding. The chicken coop was moved off site as part of the restoration project. The building labeled as the "post office" was once attached as a shed addition to the "night miller's" house. This shed has been reattached to the miller's house as part of the current restoration project.

The mill's head race and tail race are counted as non contributing structures, due to a lack of a high degree of integrity from the period of significance.

Mill Description

Exterior

Measuring 30' by 50', the Lightfoot Mill is a two-and-one-half story, gabled roof structure (See Figures 4, 5, 10, 11, 12, and 13).[1] The first floor of the Lightfoot Mill is at grade on all but the south side, which is dug into a slope to provide proper fall for the head water onto the overshot water wheel inside the building and to allow at-grade entry onto the second floor (See Figures 17-19). Located to the east of the wheel pit and between the first and second floors, is an intermediate floor level that is supported on the hurst frame. The intermediate floor level, known as the stone floor, spans the width of the mill and is 9-feet wide. The mill's length runs east to west and parallel to the Pickering Creek. Approximately 18-inches thick, the exterior walls are of random coursed fieldstone construction with large, stone corner quoining. The east gable end wall is also random fieldstone, while the west gable is wood frame covered with board-and-batten siding. The wood shingle roof is penetrated by a brick chimney at the east end. The eaves are supported by exposed, shaped rafter tails.

The four facades have an irregular fenestration pattern. The door and window frames are plank-framed with mortise and tenon corner joinery and exposed wood pin connections. The windows are single-hung with wood sash and a six-over-six pane configuration unless otherwise noted. Dimensions given to windows and doors are to the masonry opening. The fenestration of the mill is comprised of three window types: 3-foot by 5-foot single-hung, 2-½ by 2-½ foot fixed sash, and 2-½ by 4-½ foot attic windows.

The east façade has a door and window at the first floor level. Located just north of center, the door is a vertical board door with six lights in the top half of the door. Located approximately 3-feet from the southeast corner is a four-pane, fixed sash window (providing light to the lower level) that has a stone window well to hold back the grade. Directly above the fixed window is a vertical board door at the second floor. Also located at the second floor level is a window that is approximately 4-feet 3-inches from the northeast corner. Two, four-over-four, windows are symmetrically placed at the attic floor level.

On the south façade, the fenestration at the first floor consists of one single-hung and one fixed four-pane window. The four-pane fixed window is approximately 22-feet from the southwest corner. The other window is located approximately 6-feet from the southeast corner and is enclosed by a stone window well. At the stone floor, there is a window that is approximately 16-feet 8-inches from the southwest corner. This low window lights the millstones at the level of the stone floor directly atop the hurst frame, a feature typical of pre-Evans power transmission systems. A door and one window are located at the second floor level. The door is positioned just east of center and the window is centered between the door and the southeast corner. In addition to the door and windows on the south façade, an 18-inch diameter iron pipe flume penetrates the exterior wall approximately halfway between the southwest corner and the stone floor window.

The west façade has a centrally located board door at the first floor that provides access to the wheel pit area. The door has wrought iron strap hinges and a sliding bolt latch. Directly above the door is a window at the second floor level. Symmetrically placed in the wood frame gable are two windows.

The north façade has a door and two windows at the first floor, one window at the stone floor level and two windows at the second floor. At the first floor, a four-pane fixed window is located 23-feet from the northwest

[1]In order to simplify the building description, the façade that truly faces northwest will be identified as the north façade and all other building elements will be identified accordingly.

corner. A door is located to the east of the four-pane window. A second window is located 6-feet 6-inches from the northeast corner. A wood frame access opening for the mill shafts (approximately the size of the fixed four-pane window) is located 17-feet 3-inches from the northwest corner with its sill height being approximately 6-inches above grade. Located directly above this opening is the window at the stone floor level. Directly above the first floor door and the single-hung window are the two second floor windows. Located below grade near the northwest corner is a stone arch opening for the mill's tailrace. The random rubble fieldstone walls of the tailrace run north for approximately 18-feet from the mill building then make a radius turn to the east.

A mid- to late-twentieth century cider press and saw mill formerly abutted the easterly half of the north facade. The unstable and severely dilapidated frame structure was documented in 1983 and removed.[2]

Interior and Machinery

Interior Framing and Finishes

The interior of the mill has both exposed and plastered stone walls, wood floor framing and wood flooring (See Figures 17-19). On the first floor, a rectangular area in the southeast corner is a dirt floor. The remaining floor area is covered by plank flooring.

The second floor framing consists of wood floor joists supported by stone bearing walls at one end and a central east-to-west summer beam. The summer beam is 15 ½ inches wide by 14 inches high and spans from the east stone wall to the hurst frame. Pocketed into the east wall, it is supported by a 15 inches by 15 inches octagonal column that is located approximately 18 feet from the east wall. Wood floor joists measuring 9 ½ inches deep by 7 inches wide and spaced 24 inches on center, are mortised into the summer beam and pocketed into the north and south exterior walls. The second floor has random width board floors.

The attic floor is supported by a 14 ½ inches by 11 inches summer beam that spans from the east to the west wall. Posts located above the first floor octagonal column and the west side of the hurst frame provide intermediate support for the summer beam. Mortised into the summer beam and pocketed into the north and south exterior walls are 2 ¾ inches wide by 7 inches deep wood, floor joists spaced 15 inches on center. The attic has a random width wood floor.

The roof is supported by tapered wood rafters, measuring 3 inches wide by 5 ½ inches deep and spaced approximately 27 inches on center. The rafters taper to 3 inches by 4 ½ inches at the ridge and are joined by a bridle joint having an exposed wood pin. Collar ties measuring 3 inches by 4 inches are located on every other rafter joined by a half lap joint, also pinned. Rafters are notched at the wall plate and secured with an iron spike. Unusual wood brackets connecting the wall plates to the attic floor framing restrain the lateral forces exerted by the roof framing on the tops of the stone knee walls. These braces consist of a 2 ¾ inches by 5 inches horizontal member that is secured to the top plate by a dovetail joint, held fast with a 1 ½ inch diameter dowel. Extending horizontally from the plate, this horizontal member is joined to a vertical member that is pinned through the top and mortised into the floor joist at the bottom. A diagonal brace gives additional rigidity to the vertical member by being pinned through the center and angling back to the exterior stone wall. The diagonal brace is also mortised into the floor joist at the bottom. The overall width and height of these braces

[2] John R. Bowie, AIA, "Documentation of the Cider Press and Saw Mill at the Collins' Mill," November 6, 1983. Mill at Anselma Preservation and Educational Trust, Chester Springs, PA.

varies. These simple rigid braces prevent the plates from spreading and were used as an adjunct to the collar ties in resisting the lateral forces of the roof and mill machinery suspended from the roof framing. The wall plates, measuring 9 ½ inches wide by 7 inches high, are rabbeted into the top of the stone walls and are exposed at the building's exterior.

Connecting the first floor and the stone floor is a wood, open riser stair located just to the south of the octagonal column. To the south of the landing of the first stair, a wood, open riser stair also connects the stone floor to the second floor. A third, wood, open riser stair connects the second floor with the attic floor.

The Hurst Frame and Machinery

The layout of the mill's wooden grain mill machinery is almost identical to Thomas Ellicott's illustration of an "old fashioned" mill printed in Oliver Evans' 1795 book The Young Millwright and Miller's Guide (See Figure 16 and 20). The Lightfoot Mill layout is typical of 18th century custom mills and retains its original type of machinery with later added-on Oliver Evans type mechanical improvements. See Figure 15 for a description of how grains were moved through the mill and the grinding process.

The interior of the first floor is dominated by the heavily built post-and-beam, mortise-and-tenon, hurst frame that supports the millstones, gears and much of the shafting (See Figures 20 and 21). The hurst frame stands independently from the mill foundation and walls in order to isolate the vibration of the machinery. The majority of the power transmission machinery is concentrated within the confines of the frame. It is here that the wooden cogged master face wheel transfers power from the water wheel to the lantern pinion wallowers. The wallowers turn the counter-shafts, which transfer the power to the mill machinery. Face wheels on the counter-shafts supply power to the trundle gears on the millstone spindles. Beyond the hurst frame along the west end of the building lies the wheel pit and the 16-feet by 3-feet steel Fitz water wheel that replaced the wooden wheel circa 1906 (Figure 9).

Also on the first floor, a large fireplace is situated at the approximate center of the east wall. Pre-automated custom mills such as the Lightfoot mill typically had fireplaces for heat on the first floor or basement level since this was the miller's primary workspace. Prior to the introduction of Oliver Evans elevators, the miller spent most of his time at the bottom floor. Manual labor was required to transfer barrel loads of grain and meal by hoist to the top floor to load grain into hoppers that fed to the millstones and to lift meal to the bolters.

Due to the wear caused by continuous use, some mill parts were periodically replaced but the mill machinery was maintained to its original design. The tentering staff and bottle weight at the Lightfoot Mill are a rare survival of an 18th century method of adjusting the critical distance between the millstones. The mill was also upgraded in the early 19th century by adding elevators for the meal bins and conveyors that closely follow Oliver Evans' design for an automated mill. An early elevator carries meal automatically from the bin of the northern-most run of stones to the bolter in the attic.

In addition to the milling machinery, the first floor has overhead line shafts that were installed later (probably during the early 20th century) to supply power to woodworking equipment placed at the east end of the building.

Centered on the hurst frame is a half-flight of stairs that leads to the stone floor where three pairs of millstones, hoops, horses and hoppers are located. The two stones nearest the south wall are straight dressed (a pattern of sharpening the stones to improve efficiency in grinding grains) and were used for grinding animal feed and corn meal. The other two pair of stones are quarter dressed French buhrs for grinding wheat. Two millstone cranes are located along the west edge of the floor adjacent to the wheel pit. The header tank is mounted at the end of

the cast-iron flume that projects through the wall near the southwest corner of the mill. The steel header tank directs the head water onto the water wheel and contains the wheel control gate.

Two steps up from the stone floor lead to the second floor. The second floor has a turned newel post indicative of the decorative elements found in much of the craftsmanship throughout the mill building. A feed bagger is located near the stairs and is approximately centered on the south wall of the mill building. An elevator running from the first floor to the bagger on the second floor with a short conveyor and bagging machine serves the feed stone. North of the bagger are the stairs leading to the attic, the barrel hoist, and the elevator that comes up from the bottom floor to the top floor. Another early Evans-type elevator that moves the grain to the scourer in the attic is adjacent to the north side of the stairs. After being cleaned by the scourer the grain dropped down a chute to a bin on the floor above the water wheel from which it could be directed to either pair of the French buhr stones on the stone floor.

Sometime after the elevators and conveyors had been installed, a small office was built in the northeast corner of the second floor. After the mill had been partially automated, the second floor became the primary work area. The office was later enlarged circa 1927 according to the oral interview conducted by James B. Akerman with Oliver Ernest Collins, miller, July 6 and July 10, 1972.

The office is approximately 9-feet 6-inches by 13-feet 6-inches and has a door near its northwest corner. The office interior walls have two 3-feet by 6-feet, twelve light, fixed windows in the west wall and two more in the south wall. A large flour bin is backed against the south office wall with its end against the chimney in the east wall. An early flour press of the design originally patented by Oliver Evans' younger brother Evan Evans is located west of the flour bin. The flour press compressed the flour in the barrel with a wooden disc forced firmly downward by a compound lever (toggle joint) operated by hand.

Just as the first floor apparently became a woodshop after the center of activity moved to the second floor, the second floor became a machinist's shop after the gristmill business tapered off in the early 20th century. Line shafts, shop equipment and sharpening machines were installed on the second floor. The 20th century equipment had been documented under the direction of Frank McKelvey, Jr., Curator of Mechanical Arts at the Hagely Museum and Library, in 1972. Copies of the documentation are on file at The Mill at Anselma Preservation and Educational Trust, Inc. office as well as at the Hagely Museum and Library. The shop equipment was removed during restoration efforts during the 1970s.

The attic is crowded with elevators, chutes and equipment. The barrel hoist is located in the center of the building alongside the stairs. The hoist drum and its shaft are supported by a heavy framework mounted on the north side of the stairs and positioned over the hoist opening through the floor. The scourer (which cleaned dirt off the grain) is located on the floor beneath the ridge line west of the stair and is vented through the west gable by way of a long pipe. Chutes drop through the floor to feed grain into the hoppers above the wheat millstones. The long bolting machine runs from the northeast corner to within a few feet of the hoist.

The bolter (Figure 8) sifted the flour through a revolving bolting cloth (silk-mesh) covered drum (reel). The flour tumbled down the bolting reel and was sorted through two grades of cloth. The flour then moved down rope flight conveyors below the bolting reel to drop down two separate chutes to the wheat flour bins on the floor below. The conveyor is a very rare early type consisting of rope coiled around a shaft to form an Archimedes' screw. The rope on one half of the shaft is wound in one direction and the rope on the other half is wound in the opposite direction to convey the two grades of flour to the appropriate chutes. The tailings drop from the east end of the bolter into another conveyor beneath the attic floor and are carried back to the stones to be reground. It is unusual for these bulky and somewhat fragile bolting machines to survive. The typical, now

extremely rare, all wood pin gear power transmission system for these machines is intact. Also typical of custom mills are the grist parcel bins along the north wall. These small bins are indicative of the custom mill and were necessary to prevent each individual client's grain from becoming intermixed with other's grain.

Restoration Work

The mill was purchased by the French and Pickering Creeks Conservation Trust in 1983 and the Trust designated a committee to administer the preservation of the mill. During 1983 through 1987, stabilization and drainage work was done; new electrical distribution, intrusion and fire alarms were installed; and the breached embankment of the tailrace was repaired. The decayed wooden mill floor on the first floor was removed and replicated. The flooring nearest the hurst frame was replaced with recycled original floor boards. Deteriorated hurst frame members were carefully replicated. New rafters and collars to match the originals were installed where originals were severely deteriorated, the oak lath was repaired, and new shingles replaced the worn out corrugated sheet steel roofing.

During 1985–86 a severe washout in the head race overflow spillway was repaired. One-hundred-and-fifty tons of clay and 175 tons of rock were used to rebuild the washed out area and provide for emergency overflow at times of flooding. A new head gate structure was installed. The water was returned to the headrace and the millpond once again was filled.

In 1987, further site work was completed. Archeological investigations were done in preparation for the construction of the new driveway and parking area at the mill, which was finished in gravel.

The millrace received additional work at the spillway to prevent erosion. The unstable walls of the wheel pit were rebuilt and decayed members of the hurst frame were removed. Inside the mill, the master wheel was also removed for rebuilding and was subsequently replaced. The wall below the main water intake pipe (flume) was repaired.

In 1989 massive oak beams were cut and shaped to replicate the decayed elements of the hurst frame that had needed replacement.

During 2001 to 2003 repair and restoration work resumed at the mill. The first floor summer beam was jacked and re-leveled and rotted joist ends on the first floor were scarfed to repair them. Much attention was given to repairing the mill machinery by carefully replicating worn or damaged parts. In 2002 the replicated Fitz water wheel (the original shaft, bearings, hubs and arms were re-used) and the header tank were reinstalled.

The deteriorated master wheel and one counter cog wheel could not be repaired, and were replicated. The originals have been preserved as artifacts. Others were rebuilt or repaired. A worn lantern-type stone nut and the wallower were repaired. The tentering system (that controls the relationship between the grinding stones) was reassembled. The two existing original face gears were re-cogged. The water wheel shaft bearing castings were refurbished. The elevators were cleaned and repaired as needed. The sack hoist received repairs and was made operable. The feed stones were redressed. Cedar planking was reinstalled on the wheel pit side of the hurst frame to protect the hurst frame and equipment from water damage caused by the turning water wheel. The third floor pin drive power transmission components have been put back into running order. The bolter reels were re-silked and the scourer repaired. Three sections of rotted wall plate have been replaced, the plates have been pulled back into position and the roof was jacked back into place. For additional stabilization, two reinforcement plates were added on collar ties that were interrupted by machinery. Two of the attic plate braces were rebuilt and two missing ones were replaced. The exterior walls of the mill were repointed where

necessary with mortar that was carefully matched using on-site creek sand. Special care has been taken to preserve as much original material as possible while bringing the mill up to working order. All replaced elements of the mill have been carefully replicated in order to maintain the high degree of historic integrity that is so remarkable at the Lightfoot Mill at Anselma.

8. STATEMENT OF SIGNIFICANCE

Certifying official has considered the significance of this property in relation to other properties:
Nationally: X Statewide:__ Locally:__

Applicable National Register Criteria: A x B__ C x D__

Criteria Considerations (Exceptions): A__ B__ C__ D__ E__ F__ G__

NHL Criteria: 4

NHL Theme(s): VI. Expanding Science and Technology

Areas of Significance: Architecture, industry

Period(s) of Significance: c. 1749-c. 1830

Significant Dates: c. 1749

Significant Person(s): n/a

Cultural Affiliation: n/a

Architect/Builder: n/a

Historic Contexts: XVIII. Technology
G. Industrial production processes

State Significance of Property, and Justify Criteria, Criteria Considerations, and Areas and Periods of Significance Noted Above.

Today, water-powered grist mills are nostalgic symbols on the landscape: quaint, quiet, and picturesque artifacts located "down by the old mill stream." However in the eighteenth century mills were active places of commerce, industry, and trade that provided linkages between colonial farmers and the Atlantic trade and economy. "Water mills were the most sophisticated source of mechanical power and one of the most advanced technologies of the eighteenth century world. The establishment and operation of mills attracted creative talent, both entrepreneurial...and technical." In fact, the late eighteenth century transformation of colonial milling–from "custom" to "merchant" milling, as a result of increased trading relationships and markets in the international economy, "became the basis of industrialization in British America."[3]

The Lightfoot Mill is nationally significant as an extremely rare archetypal example of a small, eighteenth century, custom grain mill with its surviving, completely intact power transmission system (See Figures 6 and 7).[4] The basic technology of this industrial artifact is that of the mid-eighteenth century, later adapted to make use of several of the automating inventions of the famous eighteenth century American inventor, Oliver Evans.[5] Throughout the history of its operation, significant mill machinery was repaired and maintained in its original order and form and the milling system process still functions today as it did when first built.[6] The Lightfoot Mill is the nation's prime known surviving example of pre-Evans custom grain mill technology.[7] The early

---

[3] McCusker & Menard, *The Economy of British America*, pg. 323, 325. The rarity and significance of the Lightfoot Mill has been noted for several years. In 1972, John Tyler, Curator of Science, Industry, and Technology at the William Penn Memorial Museum recorded his impressions of the mill in a letter to Mrs. Samuel W. Morris, Secretary, French and Pickering Creeks Conservation Trust: "Usually when I am asked to look at a mill I am prepared to be a little disappointed because few people recognize early mill machinery...and while many [mills] are worthy of preservation, they are not as interesting, nor as rare as those that do indeed retain their original gearing. Therefore I was truly delighted to see that the Collins mill was everything you had said over the phone, and more." Mr. Tyler detailed several significant features of the mill: "The machinery that we see in place today is of the exact original type, and is not usually fonnd in such a complete form."

[4] In 1984, Stephen J. Kindig, an expert on historic mills, supported proposed finnding for the mill from the National Trust for Historic Preservation. "Simply stated, I have never fonnd an example to equal the Collins Mill. Whereas there are several partial examples extant, the Collins Mill is the only one complete in all the necessary machinery–of the 'wooden age'–to produce 'white flour' from wheat and animal feed from various other grains."

[5] "The work of Oliver Evans, 'one of the world's most important inventors,' epitomizes the innovative technology that appeared in this sector of the colonial economy. By 1787 Evans had fully automated the flour-milling process, the first instance in history of a completely automated production facility." John J. McCusker and Russell B. Menard, *The Economy of British North America*, 1607-1789.University of North Carolina Press, 1985, pgs. 323-324.

[6] It is probable that no moving parts of the power transmission system remain from c. 1749 since wear from usage necessitated routine replacement of wooden drive train parts in these mills. National Park Service guidelines include the consideration of a historic places that require periodic maintenance for operation and safety. When changes are in the form of renewal and replacement, either to continue operation historically or to perform a restoration, the structure will remain eligible if renewed features are replaced with materials, which in their composition, design, color, texture, and workmanship retain the historic character of the property.

[7] To date, searches have not located any other existing eighteenth century custom mills with surviving eighteenth century type equipment and power transmission layouts in the United States. The State Historic Preservation Officers and historians from the State Historical Societies/Archives in the thirteen original colonies plus West Virginia were queried about existing eighteenth century grist mills with surviving eighteenth century power transmission systems but nothing comparable was identified. In addition, the Society for the Preservation of Old Mills(SPOOM) and regional molinologists have not been able to identify any eighteenth century custom mills that retain their machinery. SPOOM maintains a list of extant and former mills in the eastern states. In 2003, millwright Derek Ogden, for example, noted: "I had known of Collin's Mill since 1976 and have always considered it to be one of the very few early

Oliver Evans labor saving improvements were appended to the original works. Thus, by observing the addition of the Evans elevators and conveyors and noting their juxtaposition with the original pre-Evans equipment one can witness an artifactual record that clearly demonstrates the extraordinary impact of Evans' inventions and the introduction of the epoch-changing concept of automation.[8]

Prior to the American Revolutionary War, most mills were small operations serving only the local agricultural community. These small "custom mills," ground grain for individuals on a percentage basis, the miller typically collecting a 10 to 20 percent toll as payment.[9] The difficulties and high cost of transporting wheat and corn encouraged the construction of numerous custom mills that served a community with a radius of about 10 miles, the distance that a farmer could conveniently travel round-trip in one day.[10] Almost every farmer grew some wheat and corn during the colonial period, and a wide scattering of small custom mills was needed to grind the grain. In 1786 Thomas Jefferson said, "There is no neighborhood in any part of the United States without a water gristmill for grinding the corn of the neighborhood."[11] The mills played an especially significant role in regions that did not follow the New England settlement pattern of nucleated clustered towns. Mid-Atlantic and Southern mills became important as economic and social centers where locals could meet to exchange news, to socialize and to conduct business. The millers sold surplus flour collected from the miller's toll to local tradesmen that did not farm and also transported some flour to market. Millers became the local source for facts about the market economy which helped farmers make informed decisions about what crops to plant.[12]

To fully understand and appreciate the importance of the Lightfoot mill and its place in our nation's history, one must compare the different roles that the "custom" and the "merchant" mill played in the development of American industrial technology.[13] Within the fertile wheat growing country along the east coast, at locations where there was a good source of water for power and for transportation, another type of mill, the "merchant mill," soon thrived. Merchant mill operators purchased large quantities of grain, stored

---

historic water mills which contains wonderful examples of the millwrights art," adding, "I know of only three water mills in the conntry where there are good examples of early bolters and Collin's Mill is one of them and probably the best."

[8] "We do know much less about the various milling industries in the colonies than we do about the iron industry. This is surprising since milling industries contributed much more in total value to the colonial economy and were technically more progressive, chiefly in the development and diffusion of laborsaving devices." McCusker & Menard, *Economy of British America*, pg. 327.

[9] Charles Howell and Allan Keller, *The Mill at Philipsburg Manor Upper Mills and A Brief History of Milling* (New York: Sleepy Hollow Restorations, 1977), p.100.

[10] John Storck and Walter Dorwin Teague, *Flour For Man's Bread: A History of Milling* (Minneapolis: University of Minnesota Press, 1952), p. 146 and Charles B. Kuhlmann, *The Development of the Flour-Milling Industry in the United States* (1929; reprint, Clifton NJ: August M. Kelley Publishers, 1973), p. 33.

[11] Thomas Jefferson, *Writings*, v, 403. Letter to M. de Warville, August 15, 1786.

[12] John J. McCusker and Russell R. Menard, *Economy of British America*, 1985), p. 321.

[13] For example, George Washington first acquired a gristmill when he iuherited Monnt Vernon from the widow of his half-brother, Lawrence, in 1754. This first enterprise was a "custom mill," where wheat and corn were gronnd not for sale, but mainly for neighboring farmers and for consumption on the Estate. In 1770, Washington decided to build a "merchant mill," which began operation the following year. Here flour and cornmeal were gronnd, not only for use at Monnt Vernon but also for sale up and down the East Coast of America and as far away as Portugal and the West Indies. The new mill had two pairs of stones. One pair was used to grind wheat into flour, and the other pair was used to grind corn into meal. It is a reconstruction of this mill that you can see today at Monnt Vernon.

it, and ground it to produce flour in volume for domestic and export sale. Philadelphia became the leader in American flour trading, well surpassing Boston and New York, during the period just prior to and after the Revolution.[14] In America, millers realized that they need not serve only a local community as they had done under the traditional European feudal economic system that discouraged large milling operations. American custom mills had continued this tradition by grinding for individual farmers and collecting a percentage from each individual to pay for the miller's services. Merchant mills benefitted American farmers who farmed on a much larger scale than in Europe; farmers could grow large quantities of grain and sell it directly to the merchant mills for cash. Mills became multi-storied structures and ran as many as six pairs of stones from a single water wheel.[15] The diminutive old-fashioned custom mills rapidly became obsolete and were usually upgraded and enlarged or were completely rebuilt to operate as merchant mills. A few rural custom mills, such as the Lightfoot Mill, continued to serve the local community by operating as very small scale merchant mills.

During the early 1770s about one-third of the wheat produced in Pennsylvania was exported, primarily as flour and bread. Nearly half of Pennsylvania's export income and an estimated half of the average farm sales came from this source.[16] Merchant milling rapidly grew along the Wissahickon, in Philadelphia, and the Brandywine, in Delaware. In 1760, over 80 mills where located in Philadelphia County alone, and most of them were grinding flour for export trade.[17] By the 1790s the Brandywine powered 60 gristmills in Wilmington, Delaware.[18] At that time Robert Proud wrote that the Wissahickon and the Brandywine were "noted for the best and most numerous grist-mills, either in this province, or any other part of British America,...and which, perhaps, are not inferior in quality, to any in the world."[19] The impact of merchant milling can be seen in the value of exports from the middle colonies in the period from 1768 to 1782. A total of more than £379,000 of grain products were exported to Great Britain, Ireland, southern Europe, the West Indies, and Africa, representing over 72 percent of all exported products.[20]

The scale of merchant milling operations grew even larger as American millers adopted Oliver Evans' revolutionary concept of the automatic flour mill. The automatic mill cut in half the labor necessary to operate a mill. "Formerly, one hand was required for every ten barrels of flour that the mill made daily; now one for every twenty barrels is sufficient. A mill that made forty barrels a day, required four men and a boy; two men are now sufficient."[21] The concept of automation can not be overestimated; it

---

[14] John Storck and Walter Dorwin Teague, *Flour For Man's Bread: A History of Milling* (Minneapolis: University of Minnesota Press, 1952), p. 152 and Charles B. Kuhlmann, *The Development of the Flour-Milling Industry in the United States* (1929; reprint, Clifton NJ: August M. Kelley Publishers, 1973), pp. 24, 34.

[15] Charles Howell and Allan Keller, *The Mill at Philipsburg Manor Upper Mills and A Brief History of Milling* (New York: Sleepy Hollow Restorations, 1977), p. 102.

[16] James T. Lemon, *The Best Poor Man's Country* (Baltimore: Johns Hopkins Press, 1972), p. 181.

[17] Sylvester K. Stevens, Ph.D, *Pennsylvania: Titan of Industry* (New York: Lewis Historical Publishing Company, Inc., 1948), p. 78.

[18] John J. McCusker and Russell R. Menard, *The Economy of British America, 1607-1789* (Chapel Hill: University of North Carolina Press for the Institute of Early American History and Culture, 1985), p. 323.

[19] Robert Proud *The History of Pennsylvania in North America* (Philadelphia: Zachariah Poulson, Jr., 1797-98), v. II p. 255.

[20] McCusker and Menard, *Economy of British America*, pg. 199.

[21] Oliver Evans *The Young Millwright and Miller's Guide* (Philadelphia: n. p. 1795), Article 101, p. 124.

revolutionized the milling industry and is the foundation upon which all modern, mass-production industries are built.[22]

Millers in the region around Baltimore, Maryland were the quickest to adopt the advances provided by automation. Although, Evans had opened his experimental automatic flour mill on the Red Clay Creek in Delaware in 1785, millers in Maryland were among the first to use his radical new milling concepts on a large scale. As a result, Baltimore became a leading flour manufacturing center in the early nineteenth century, usurping the mills of Philadelphia and Delaware's former status as the nation's dominant milling centers. The new Evans type mills were more costly to set-up, but they operated much more efficiently. They made production on a truly large scale possible and encouraged the localization of the flour milling industry around chief milling centers, but at the same time, the automated merchant mills accelerated the demise of scattered small milling operations.[23]

After an initial period of reluctance, Evans' automatic milling equipment was rapidly introduced everywhere in the United States, even into existing small mills.[24] Lightfoot's modest custom mill at Anselma received early Evans type elevators to automatically transport grain to the scourer and to carry meal from the basement meal bin to the bolter where conveyors moved meal horizontally.

The Lightfoot Mill has a remarkable historical and educational value in the way that it exemplifies both traditional labor-intensive eighteenth century milling equipment and early Evans-type automation improvements. In the Lightfoot Mill, the eighteenth century flour milling machinery was never superseded by newer technology, but instead, it was supplemented by early Evans-type automation improvements. The juxtaposition of the eighteenth century custom mill machinery with the early Evans improvements allows a side-by-side comparison of pre-automation and post-automation flour milling during the transitional period. While Evans' improvements to milling technology promoted large merchant mill buildings capable of housing an ever increasing volume of grain and multiplied number of machines, the Lightfoot Mill represents the typical small country custom mill design of the pre-Evans era which became obsolete and quite rare due to its inability to compete with the more modern merchant mill concept.[25]

---

[22] Eugene S. Ferguson, *Oliver Evans: Inventive Genius of the American Industrial Revolution* (Greenville, DE: The Hagley Museum, 1980), p. 10.

[23] *The Development of the Flour-Milling Industry in the United States* (1929; reprint, Clifton NJ: August M. Kelley Publishers, 1973), pp. 71, 101.

[24] John Storck and Walter Dorwin Teague, *Flour For Man's Bread: A History of Milling* (Minneapolis: University of Minnesota Press, 1952), p. 164.

[25] Konrad Bedal, *Mühlen und Müller in Franken* (Bad Windsheim: Fränkisches Freilandmuseum, 1992), pp. 75-77. It is interesting to note that American mill technology became world-leading in the early nineteenth century, earning the automated mills the continental nomenclature of "American Mill."

Local History

Samuel Lightfoot purchased land along the Pickering Creek in Pikeland (later West Pikeland) Township and was among the earliest settlers there in 1725.[26] He established the first grain mill in the area and at that time the operation of bolting (sifting) the flour was performed by hand.[27] By the time of Pikeland's first tax records in 1747, Samuel Lightfoot had become one of the highest tax payers in the township, paying 3 shillings. Then, in 1749-50, Lightfoot's tax jumped to £1, the highest in the township.[28] The sudden jump in taxes could be evidence that the existing custom grain mill (toll mill) dates from this time. In 1765, the tax records were itemized and Lightfoot's grist mill and saw mill were specifically enumerated.[29] Wheat had become the principal crop in Southeastern Pennsylvania around 1730. This helped the economy expand and the region prospered; after 1750 custom mills of the type Lightfoot erected were being commonly built.[30] By 1759 the tax records indicated that there were four grist mills operating in Pikeland Township.[31]

As was often the case with colonial mill operators, Samuel Lightfoot was prominently involved in community political and religious affairs. In 1736, he was chosen as a commissioner of Chester County, Pennsylvania, and in 1751 he was appointed Justice of the Peace for the county. He also served as a surveyor and kept the field records for Charles Mason and Jeremiah Dixon from 1763 to 1767 during the survey to establish the Mason-Dixon line. Following Lightfoot's death in 1777, the mill was owned by his son, William, and then twenty years later by his grandson, Samuel, who sold the business in 1812.[32]

Throughout the nineteenth and early twentieth centuries, the mill continued operation under various owners. The stones were last run to grind corn and wheat in the 1930s and the waterpower was last used to power twentieth century line-shafts in the 1950s.[33] The Lightfoot Mill at Anselma was owned and operated by a continuous series of millers from Samuel Lightfoot until 1983, when the site was purchased by the French and Pickering Creeks Conservation Trust. The last miller was Oliver Ernest Collins who obtained the mill from Allen H. Simmers in 1919. Simmers purchased the mill from John Oberholtzer in 1886. John Oberholtzer took over the mill from Elias Oberholtzer in 1873. Elias Oberholtzer acquired the mill from Jones Shenaman in 1859 and Jones inherited the mill from his father Rees. Rees Shenaman bought the mill from Lewis Rees and James Benson in 1822. Rees and Benson obtained the mill from

---

[26] C. W. Heathcote, Sr., *A History of Chester County Pennsylvania* (Harrisburg: National Historical Association, Inc., Publishers, 1932), p. 197.

[27] J. Smith Futhey and Gilbert Cope, *A History of Chester County Pennsylvania, with Genealogical and Biographical Sketches* (Philadelphia: J. B. Lippincott & Co., 1881), p. 202.

[28] Chester Connty Archives, Microfilm rolls: Connty Tax Records LR 250.1 1715-1753, Provincial Tax Records LR 249.1 1715-1764.

[29] Chester Connty Archives, Microfilm roll: Provincial Tax Records LR 249.2 1765.

[30] Stephen G. Del Sordo, "Eighteenth-Century Grist Mills: Some Pennsylvania Examples," *Perspectives in Vernacular Architecture* (Annapolis: Vernacular Architecture Forum, 1982), p. 75.

[31] James T. Lemon, *The Best Poor Man's Country* (Baltimore: Johns Hopkins Press, 1972), p. 202.

[32] Eleanor Winsor, National Register of Historic Places Nomination Form: Lightfoot Mill, 1973, section 8, p. 1.

[33] Denson Groenendaal, "The Mill at Anselma" (Pottstown, PA: French and Pickering Creeks Conservation Trust, Inc., 1983), p. 6.

Samuel Lightfoot in 1812 who inherited the mill from his father William Lightfoot who, in turn, had inherited the mill from his father Samuel Lightfoot, the man, it appears who built the mill.[34]

Summary

The Lightfoot Mill at Anselma, today, is a truly exceptional intact survival of a significant artifact of American industrial history and of expanding science and technology with a high degree of historical integrity. This archetypal example of the once-common mid-eighteenth century custom mill embodies the distinguishing characteristics of the pre-Evans mill type and is of exceptional value for the study of industrial history. Already in 1795, Thomas Ellicott's illustration in The Young Millwright and Miller's Guide of an "old-fashioned" mill depicts an arrangement of the power transmission machinery almost identical to that which still remains in the Lightfoot Mill at Anselma. Broad searches have not been able to identify any other existing eighteenth century custom mills with surviving mid-eighteenth century type equipment and power transmission layouts in the United States. The Lightfoot Mill and its mill machinery as an artifact physically capture a pivotal moment in American industrial history as the old traditional technology was supplanted by the new watershed ideas of industrialization and automation. The Lightfoot Mill at Anselma is a rare survivor of a colonial era custom mill with tentative upgrades of partial automation—it has captured the humble beginnings of a rapid and remarkable change in the technological history of American milling. This change was one of the first steps in the story of worldwide industrialization.

[34] The Mill at Anselma Preservation and Educational Trust, deed research and tax records.

9. MAJOR BIBLIOGRAPHICAL REFERENCES

Bathe, Greville, and Dorothy Bathe. *Oliver Evans: A Chronicle of Early American Engineering*. Philadelphia: The Historical Society of Pennsylvania, 1935.

Bedal Konrad, *Mühlen und Müller in Franken*. Bad Windsheim: Fränkisches Freilandmuseum, 1992.

Chester County Archives, Microfilm roll: County Tax Records LR 250.1 1715-1753.

Chester County Archives, Microfilm rolls: Provincial Tax Records LR 249.1 1715-1764 and LR 249.2 1765.

Cremers, Estelle. *30,000 Acres: Vincent and Pikeland Townships 1686 to 1850.* Philadelphia: Eastern Litho Corporation, 1989.

Del Sordo, Stephen G. "Eighteenth-Century Grist Mills: Some Pennsylvania Examples," *Perspectives in Vernacular Architecture*. Annapolis: Vernacular Architecture Forum, 1982.

Evans, Oliver. *The Young Millwright and Miller's Guide*. Philadelphia: n. p., 1795.

Fegley, H. Winslow. *Among Some of the Older Mills in Eastern Pennsylvania*. Norristown, Pa: The Pennsylvania German Society, 1930.

Ferguson, Eugene S. *Oliver Evans: Inventive Genius of the American Industrial Revolution*. Greenville, DE: The Hagley Museum, 1980.

Futhey, J. Smith, and Gilbert Cope. *A History of Chester County Pennsylvania, with Genealogical and Biographical Sketches*. Philadelphia: J. B. Lippincott & Co., 1881.

Groenendaal Denson. "The Mill at Anselma." Pottstown, PA: French and Pickering Creeks Conservation Trust, Inc., 1983.

Heathcote, C. W., Sr. *A History of Chester County Pennsylvania*. Harrisburg: National Historical Association, Inc., Publishers, 1932.

Howell, Charles, and Allan Keller. *The Mill at Philipsburg Manor Upper Mills and A Brief History of Milling*. New York: Sleepy Hollow Restorations, 1977.

Kuhlmann, Charles B. *The Development of the Flour-Milling Industry in the United States, with Special References to the Industry in Minneapolis*. 1929. Reprint, Clifton, NJ: Augustus M. Kelly, 1973.

Larkin, David. *Mill: The History and Future of Naturally Powered Buildings*. New York: Universe Publishing, 2000.

Lemon, James T. *The Best Poor Man's Country*. Baltimore: Johns Hopkins Press, 1972.

McCusker, John J., and Russell R. Menard. *The Economy of British America, 1607-1789.* Chapel Hill: University of North Carolina Press for the Institute of Early American History and Culture, 1985.

Proud, Robert. *The History of Pennsylvania in North America.* Philadelphia: Zachariah Poulson, Jr., 1797-98.

Quillman, Stuart H. *History of the Conestoga Turnpike Through Chester County, Pennsylvania.* Pottstown, PA: Tursack Printing, Inc., 1993.

Storck, John and Walter Dorwin Teague. *Flour For Man's Bread: A History of Milling*. Minneapolis: University of Minnesota Press, 1952.

Stevens, Sylvester K. Ph.D. *Pennsylvania: Titan of Industry*. New York: Lewis Historical Publishing Company, Inc., 1948.

Winsor, Eleanor. National Register of Historic Places Nomination Form, Lightfoot Mill, 1973.

Previous documentation on file (NPS):

__ Preliminary Determination of Individual Listing (36 CFR 67) has been requested.
_x_ Previously Listed in the National Register.
__ Previously Determined Eligible by the National Register.
__ Designated a National Historic Landmark.
__ Recorded by Historic American Buildings Survey: #
__ Recorded by Historic American Engineering Record: #

Primary Location of Additional Data:

__ State Historic Preservation Office
__ Other State Agency
__ Federal Agency
__ Local Government
__ University
_x_ Other (Specify Repository): The Mill at Anselma Preservation and Educational Trust, Inc.

10. GEOGRAPHICAL DATA

Acreage of Property: 5

UTM References:

Zone	Easting	Northing
18	445096	4437168

Verbal Boundary Description:

Beginning at a buttonwood tree at a point between Lots No. 1 and 2; then along the same North 47 ¾ degrees West 4.8 perches to a limestone; thence by same South 37 ¾ degrees West 13 perches to a limestone; thence by lands of Herbert Ash South 54 degrees West 41.6 perches to a limestone; thence by lands of Howard White North 84 degrees East 33.9 perches to a cherry tree; thence by lands of Latshaw Eres North 1 ¼ West 22 perches to an oak tree; thence by the same North 28 ¾ degrees West 3.4 perches to a buttonwood tree; then by the same North 34 degrees West 9.6 perches to the center of the Pickering Valley Railroad; thence along the center of the same North 72 ¾ degrees East 10 perches; thence North 21 ¼ degrees West 6.4 perches to the place of beginning.

Boundary Justification:

The boundary encompasses the historic mill and is the same as was used for the National Register of Historic Places. It also was the mill tract of Oliver E. Collins, the last miller to own and operate the mill machinery before the Lightfoot Mill at Anselma was purchased by the French and Pickering Creeks Conservation Trust, Inc.

11. FORM PREPARED BY

Name/Title: Stuart W. Wells / Principal, Retrospecs
David H. Frens / Principal, Frens and Frens, LLC, Restoration Architects

Address: Retrospecs, 515 E. 1st Street, Birdsboro, PA 19508
Frens and Frens, LLC., 120 S. Church Street, West Chester, PA 19382

Telephone: Retrospecs, 610-404-2985
Frens and Frens, LLC, 610-430-7730

Date: 12 September 2003

Edited by: John H. Sprinkle, Jr., Ph.D.
National Park Service
National Historic Landmarks Survey
1849 C St., N.W., 2280
Washington, DC 20240

Telephone: (202)343-2228

NATIONAL HISTORIC LANDMARKS SURVEY
July 27, 2006

S:\NR-NHL\Nominations Draft\FALL 2004\Lightfoot Mill\Submitted\Lightfoot Mill.wpd